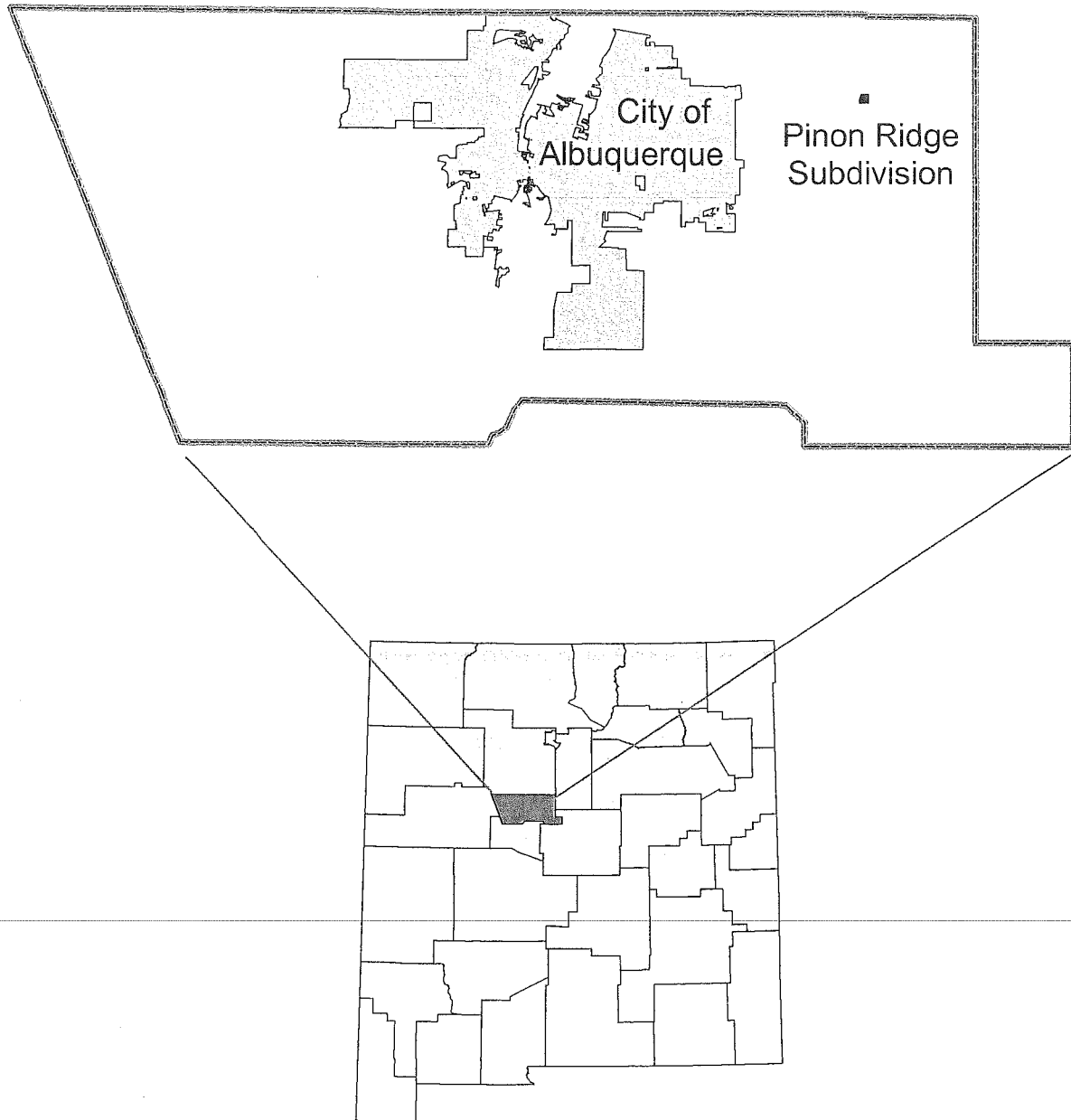


# Pinon Ridge Subdivision



# Bernalillo County



State of New Mexico

**Bernalillo County  
Environmental Health Department**

**Piñon Ridge Subdivision  
On-Site Wastewater Assessment of  
Affects on Groundwater Quality**

**December 2002**

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## **Section 1**

### **Scope and Purpose**

Piñon Ridge Subdivision historically has had problems with on-site wastewater systems. These problems stem from lots with limited topsoil, lots that are small (<.4 acres) and the required private well setback distances (100' minimum).

Private wells are used for drinking water. The development is old, with high-density development, a number of failed on-site wastewater systems, and fractured bedrock underlies the area. These factors compelled Bernalillo County Environmental Health Department (BCEHD) to study the area for groundwater contamination from septic tank effluent. The results of the findings will form the basis of the needs assessment for wastewater management.

Groundwater was sampled from a convenience sample of 45 volunteer participants from the community for constituents that may show effects of wastewater on the local groundwater. The local groundwater is the drinking water source for the subdivision. Participants volunteered by responding to survey questionnaires that were mailed to them and handed out at public meetings asking them to participate.

Table 1 is the list of participants that had their well water source sampled. Table 1 also shows the analysis of the water sampled. A sampling site location base map is included on Figure 1.

## Section 2

### Introduction

The Piñon Ridge Subdivision was platted in the mid 1960's for approximately 225 lots of approximately ½ acre size. Some lots are as small as .34 acres and some as large as 1.2 acres. There are approximately 143 homes with on-site wastewater (septic) systems and drinking water from private water supplies. Because some households discharge wastewater effluent into poor quality shallow soils, there is the continuous environmental health threat of surfacing sewage. In the last ten years there have been twenty failed systems reported and documented. Wastewater contractors have informed Bernalillo County Environmental Health staff that some failed systems have not been reported at the request of homeowners.

The principal threats to groundwater quality are bacteriological and nitrate contamination. Bacteria are present in domestic wastewater. Nitrates are produced from wastewater effluent. Nitrates are a major groundwater quality concern in areas where on-site wastewater is discharged into soil. The nitrate molecule carries a negative charge and, therefore, does not sorb to negatively charged soil particles; this enables nitrate to migrate in subsurface environments.

Prevention of groundwater contamination from inadequate wastewater treatment is a major concern. Some residents are unaware of how to maintain their wastewater systems.

The new Bernalillo County Wastewater Ordinance (12/00) requires alternative wastewater systems on small lots or lots with unsuitable soil. These alternative systems, when operated and maintained properly, can perform some denitrification and disinfection of wastewater effluent before it is disposed in the soil.

### 2.1 Sampling Methods

Groundwater samples were collected at locations listed in Table 1 and shown on Figure 1. To ensure that samples were collected properly, most of the wells were purged. Sample containers were filled at each site and were placed on ice for delivery to New Mexico Department of Health, Scientific Laboratory Division (NMDOH/SLD) within the allotted holding time.

## Section 3

### Groundwater Chemistry

The main goal of the water quality analyses was to evaluate the impact of on-site wastewater disposal systems.

Assuming background concentrations for nitrate are below the method's detection limit ( $<1$  mg/L), the presence of nitrate in 32 of the 46 well water systems sampled suggests that on-site wastewater systems are degrading groundwater quality in the Piñon Ridge Subdivision area. The average nitrate concentration of the wells in which it was detected was 1.63 mg/L, and the maximum nitrate concentration was 4.2 mg/L, both of which are below the groundwater standard of 10 mg/L, as established by the New Mexico Water Quality Control Commission (NMWQCC).

The results suggest that the quantity of nitrate reaching groundwater is limited, as a result of the thickness of the vadose zone in the area and low precipitation. It appears that nitrate is undergoing denitrification during transport in anaerobic microzones of the soil column.

Local wells in the area have experienced severe water level drops and many wells in the area have recently gone dry.

Water samples were also analyzed for cations and anions to determine if everyone was using the same water source. Trilinear diagrams were used to show this relationship and are enclosed in the report (Appendix).

Six different water types were identified with the water analysis results of cations and anions plotted on the trilinear diagrams. When a mineral is dissolved in water, the cations and anions of which it is composed will attain a specific concentration. The locations of the six water types are shown on Figures 4 through 9 and on Table 2.

**Water type number one** (Figure 4) is classified as saline. This water is high in sodium, potassium, chloride and sulfate. This water quality was influenced by an aquifer containing shale.

This water had an average nitrate concentration of .62 mg/L. The maximum nitrate concentration was 1.9 mg/L and the lowest nitrate concentration was .15 mg/L. This water was low in hardness. However, TDS averaged 1465 with a high of 1720 and a low of 1020. Sulfate averaged 665 mg/L with a high of 950 mg/L and a low of 234 mg/L.

**Water type number two** (Figure 5) is classified as permanent hardness. This water is high in calcium, magnesium, chloride and sulfate. This water quality was influenced by an aquifer containing gypsum and shale.

This water had an average nitrate concentration of .24 mg/L. The maximum nitrate concentration was 1.3 mg/L and the lowest nitrate concentration was <.1 mg/L. This water had an average TDS of 1673 with a high of 2300 and a low of 1190. Sulfate averaged 876 with a high of 1480 and a low of 643.

**Water type number three** (Figure 6) did not have a distinct classification. This water had an average nitrate concentration of 2.0 mg/L. The maximum nitrate concentration was 3.6 mg/L and the lowest nitrate concentration was <.1 mg/L. This water had an average TDS of 532 with a high of 1110 and a low of 384. This water had an average sulfate concentration of 29.3 with a high of 39.7 and a low of 20.9.

**Water type number four** (Figure 7) did not have a distinct classification. This water had an average nitrate concentration of 2.75 mg/L. The maximum nitrate concentration was 4.2 mg/L and the lowest nitrate concentration was <.1 mg/L. This water had an average TDS of 985 with a high of 1100 and a low of 800. This water had an average sulfate concentration of 41.9 with a high of 145 and a low of 7.3.

**Water type number five** (Figure 8) did not have a distinct classification. This water had an average nitrate concentration of 1.8 mg/L. The maximum nitrate concentration was 4.0 mg/L and the lowest nitrate concentration was <.1 mg/L. This water had an average TDS of 997 with a high of 1460 and a low of 712. This water had an average sulfate concentration of 182 with a high of 374 and a low of 30.7.

**Water type number six** (Figure 9) is classified as permanent hardness. This water is high in calcium, magnesium, chloride and sulfate. This water quality was influenced by an aquifer containing gypsum and calcite.

This water had an average nitrate concentration of .27 mg/L. The maximum nitrate concentration was 1.1 mg/L and the lowest nitrate concentration was <.1 mg/L. This water had an average TDS of 1331 with a high of 1740 and a low of 1010. This water had an average sulfate concentration of 668.5 with a high of 1040 and a low of 251.

## **Section 4**

### **Geology**

#### **Geologic Structure and Units**

The Piñon Ridge Subdivision lies within the Sandia Basin administered by the Office of the State Engineer. The geology of the Sandia Basin is characterized by complex fracture flow hydrology and is controlled by geologic structure. Geology that underlies the Piñon Ridge Subdivision includes sedimentary rocks, primarily sandstone, which makes up the underlying aquifers and groundwater producing zones. Both Jurassic and Cretaceous age units exist and include the Bluff Sandstone, Morrison Formation and the Dakota Formation. These beds dip towards the east and are geologically controlled by the Tijeras Fault Zone to the east and the Tijeras Syncline to the west. In the far-eastern portion of the Piñon Ridge Subdivision, deeper domestic wells can be completed in the Mancos Shale, a poorer quality formation and aquifer with elevated levels of sulfide, TDS and iron. Groundwater flow is generally to east/southeast due to the orientation of the underlying geology and easterly dip of the bedding planes. A map of the Sandia Park Quadrangle, produced by the New Mexico Bureau of Geology and Mineral Resources, is included in Figure 3.

#### **Geologic Control of Water Resources**

Complexities in the groundwater flow system arise because of the high degree of faulting, folding and fracturing in the Sandia Basin. Faulting, associated fracturing and folding have affected the hydraulic properties of fracture-flow aquifers in the following five ways (Daniel B. Stephens and Associates, Inc., 1994). First, lateral continuity tends to be reduced at faults by positioning high-permeability formations next to low-permeability formations. Second, faults that are initially vertical conduits for groundwater flow tend to become sealed by chemical deposition through time. Third, movement along faults can smear clay-rich sediment along the fault surface, thereby causing the fault to become a ground-water flow barrier. Fourth, faulting tends to disrupt the primary storage characteristics of bedrock aquifers by affecting apertures and the extent of bedding planes, solution channels, orientation of bedding planes, and the horizontal and vertical continuity of bedding planes. Fifth, groundwater flow in fractured porous aquifers is further complicated by flow in the porous blocks. Groundwater in sedimentary aquifer blocks may flow in the direction of the hydraulic gradient while ground water in fractures may move in a direction parallel to the direction of the fractures.

## Section 5

### Conclusions and Recommendations

Water from forty-six wells located in the Piñon Ridge Subdivision was sampled. The analysis results showed approximately 70% of the wells were impacted by on-site wastewater systems. However, the analysis also showed none of the water from these wells exceeded drinking water limits. The maximum nitrate concentration was 4.2 mg/L, which is below the drinking water standard of 10 mg/L.

Because the subdivision is not totally built-out (37% remaining) and the Bernalillo County Wastewater Ordinance (2000) now requires some treatment prior to disposing of wastewater on small lots, the subdivision has time to ponder the formation of a wastewater management district. Because 69% of water sources were not sampled, there remains the possibility that an individual well may have nitrate levels exceeding drinking water levels. Some residents in the subdivision share wells, and that decreases the number of water sources.

There were six distinct water sources discovered in the subdivision. Some were more impacted than others by on-site wastewater systems. These water types are discussed in Section 3 of this report. However, water type number three had the highest average nitrate concentrations. Water type number two had the highest average sulfate and TDS concentrations (natural, not attributable to on-site wastewater).

Sulfate can be a concern in the concentrations measured. The state groundwater standard for sulfate is 600.0 mg/L. High sulfate concentrations exert a laxative effect and sometimes diarrhea following acute exposures. However, these effects are not observed for longer-term exposures. This may be because of acclimation to sulfate over time. Due to the poor quality of some of the natural waters in this area, it may be a good idea to sample for other contaminants, such as arsenic, that may affect human health.

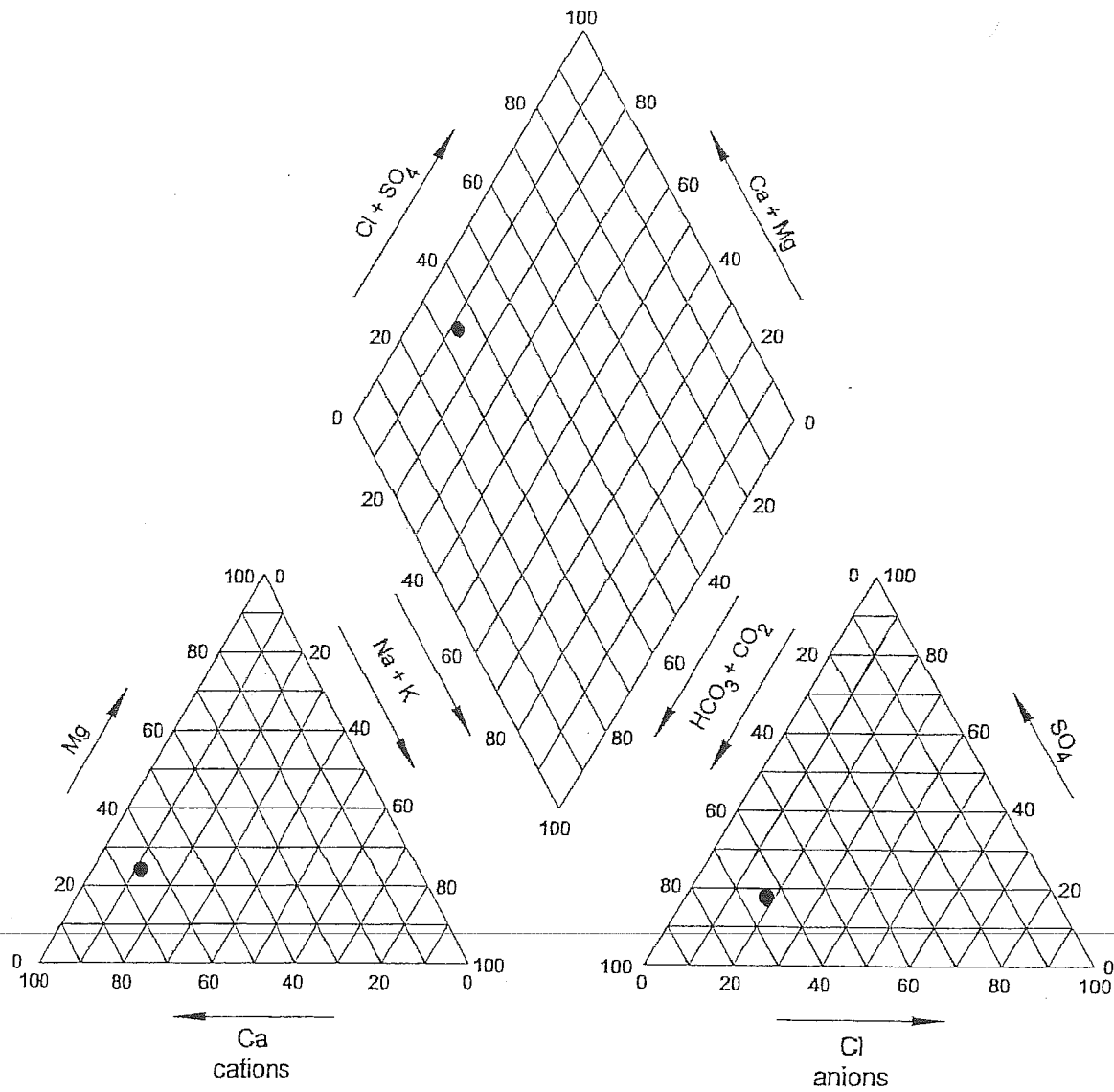
Bernalillo County Environmental Health Department (BCEHD) intends to provide educational information to the residents for the individual management of personal wastewater systems. If the citizens of Piñon Ridge organize and pursue a wastewater management entity for the subdivision, BCEHD is available to assist with technical and some administrative functions.

## Section 6

### References

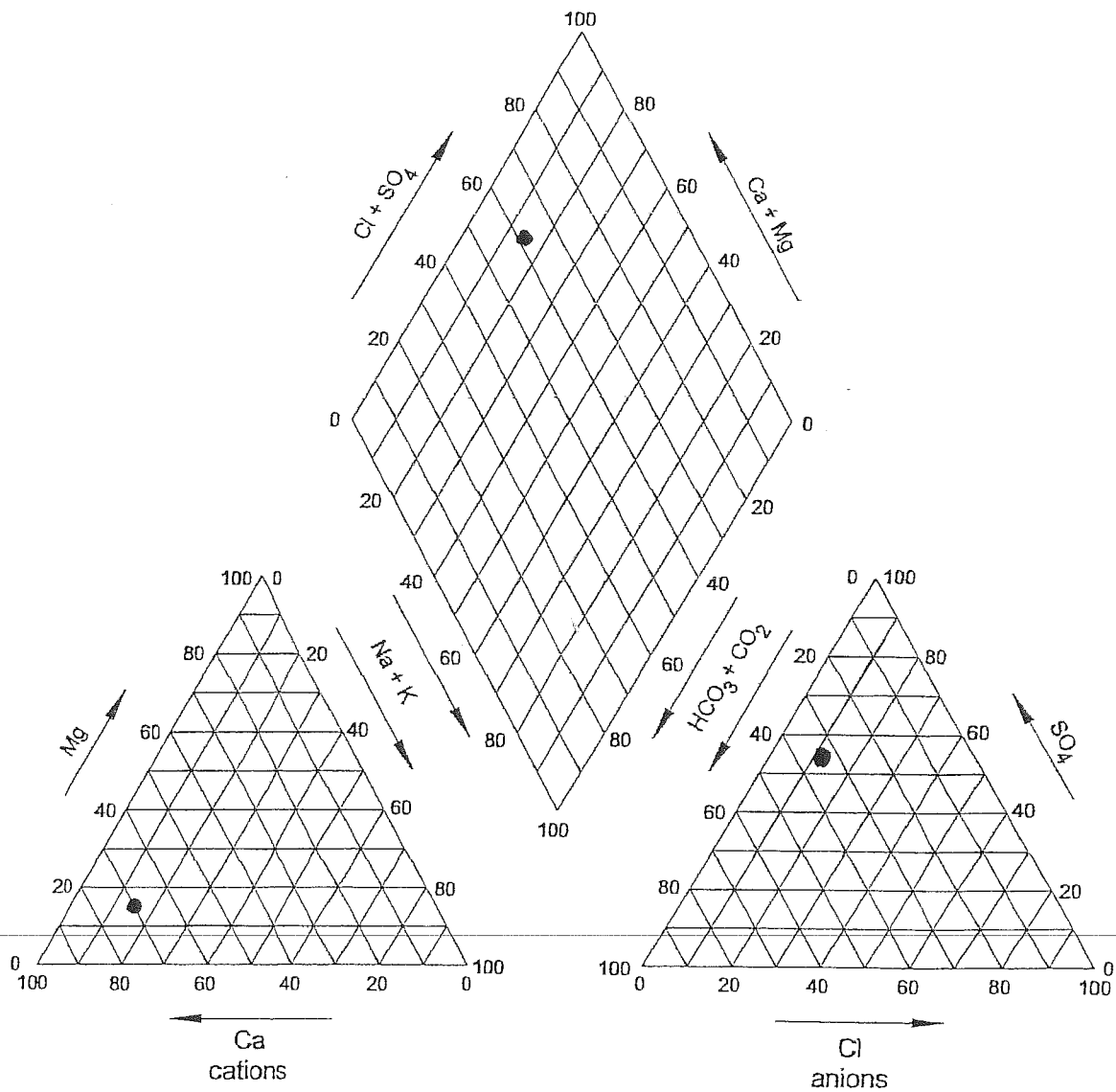
- Hounslow, Water Quality Data – Analysis and Interpretation. Boca Raton, LA: Lewis Publishers (CRC).
- U.S. Environmental Protection Agency – (<http://www.epa.gov/safewater/mcl.html>)

Right of way

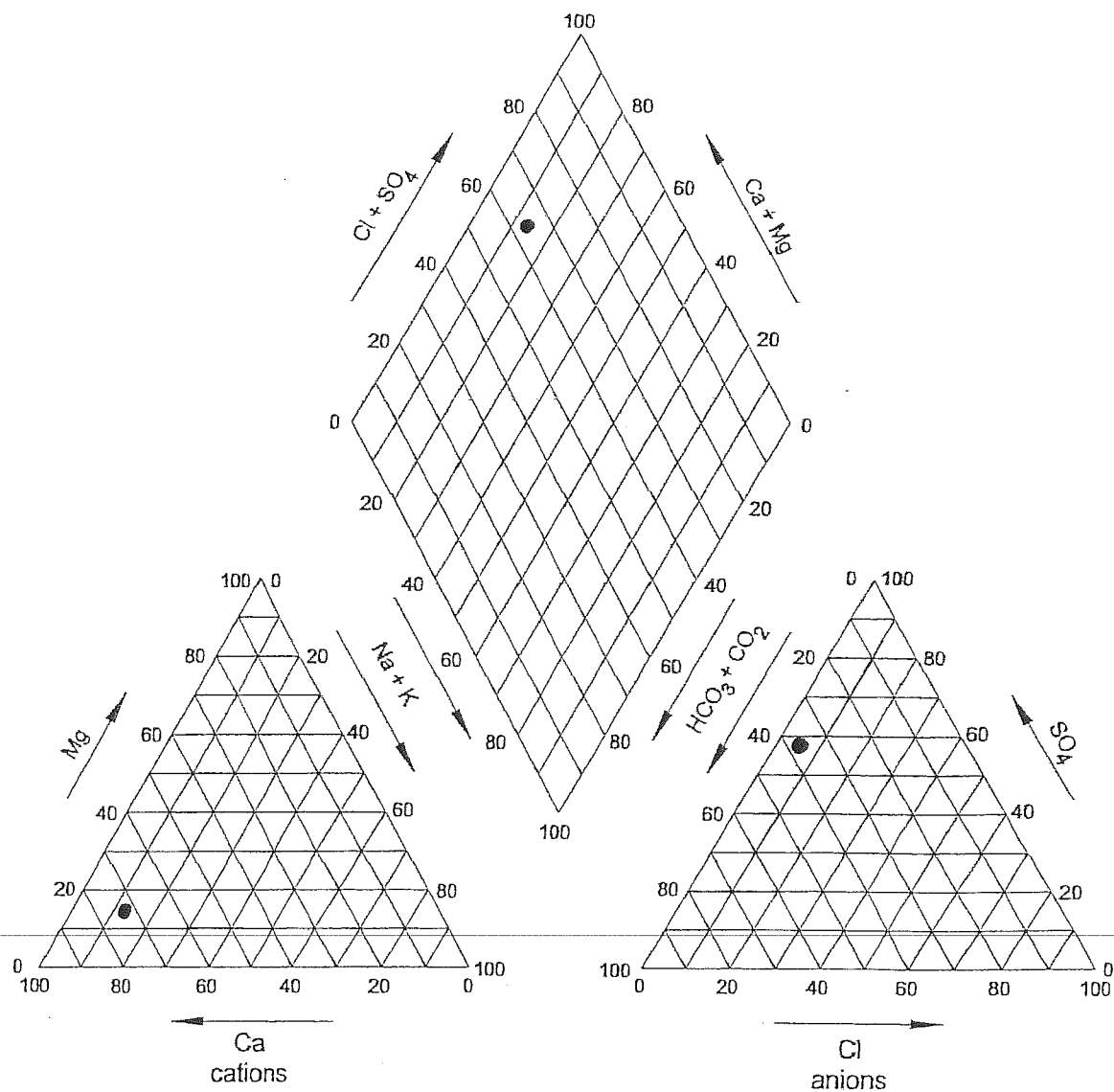


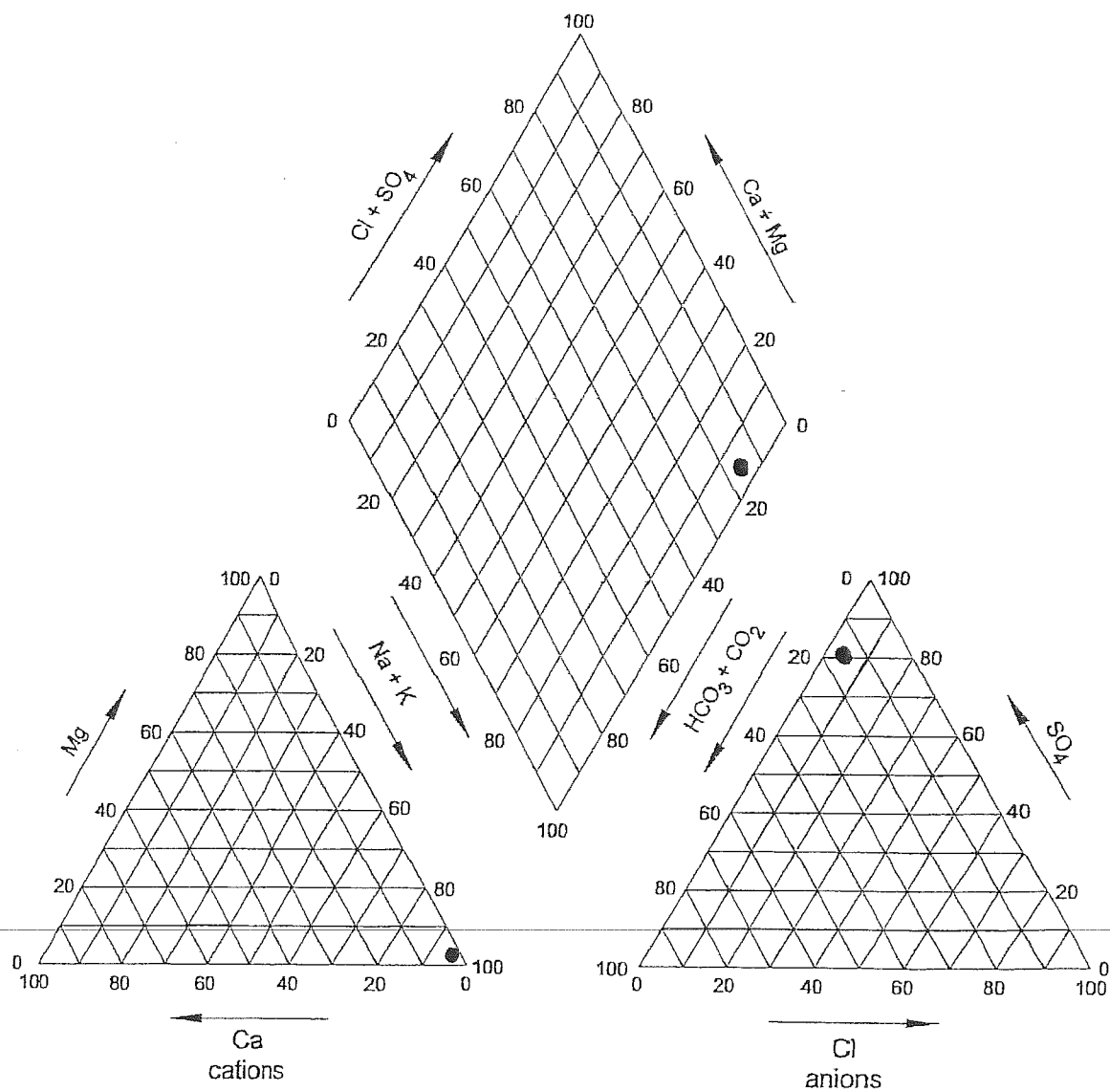


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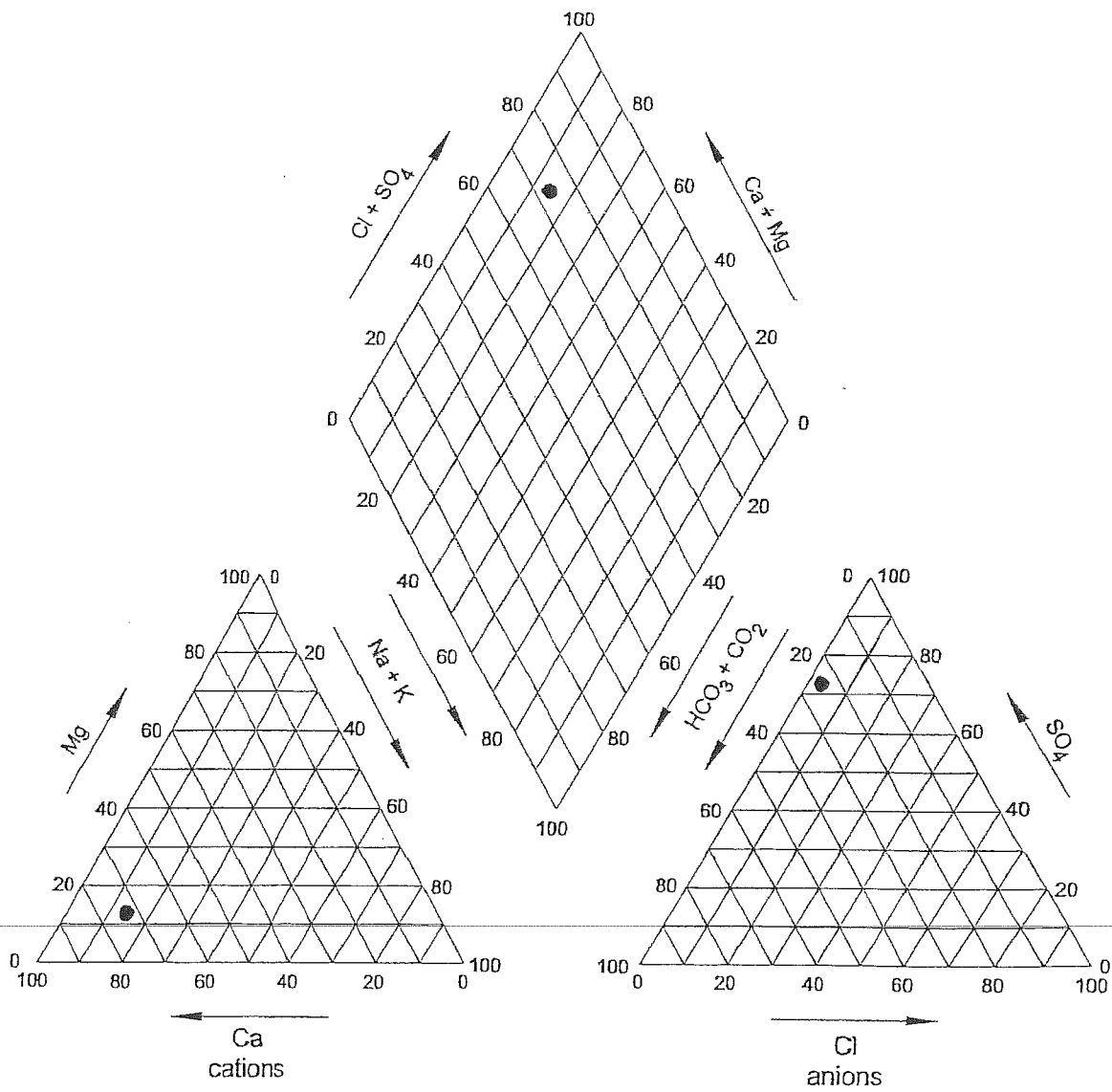


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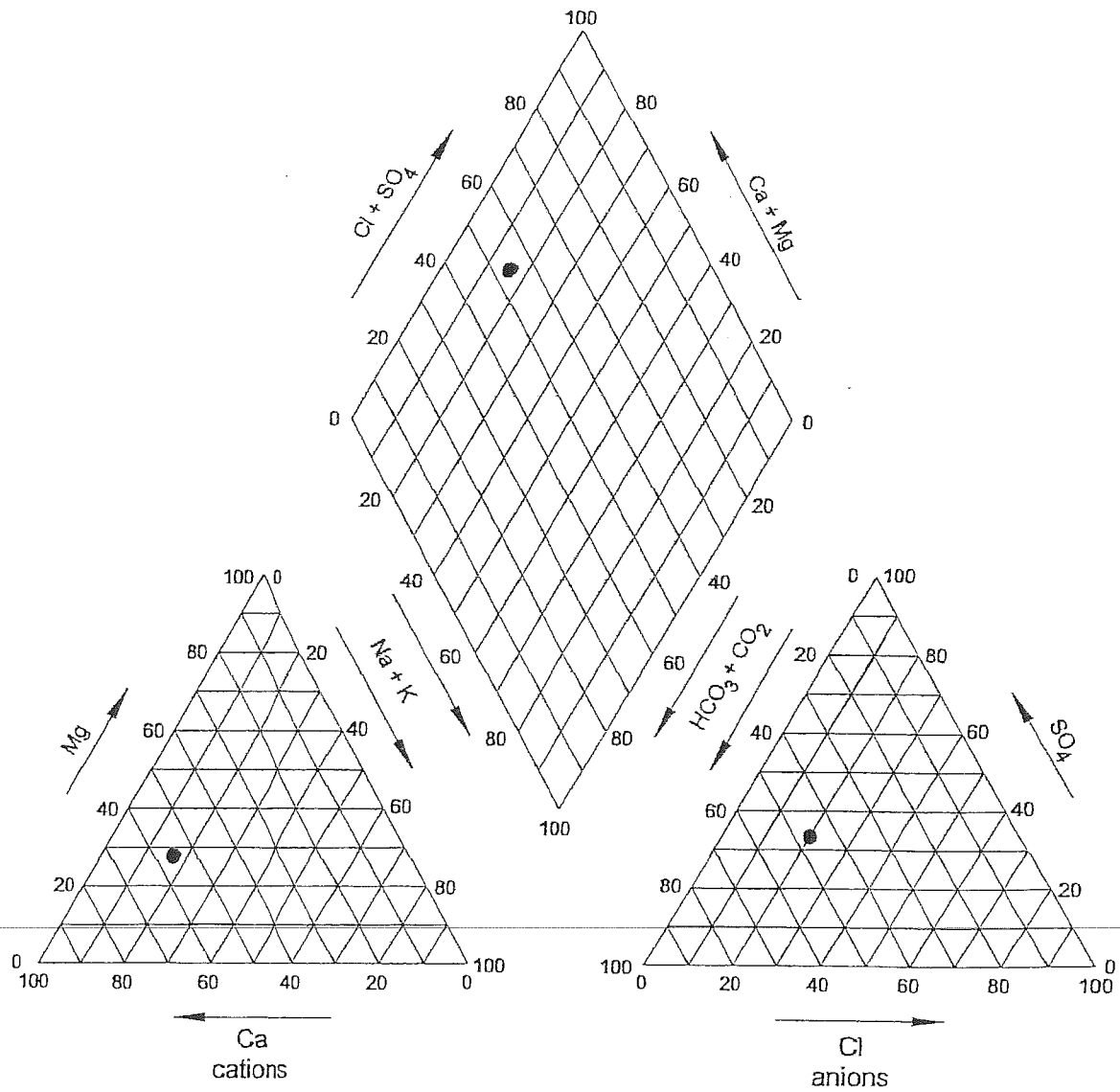




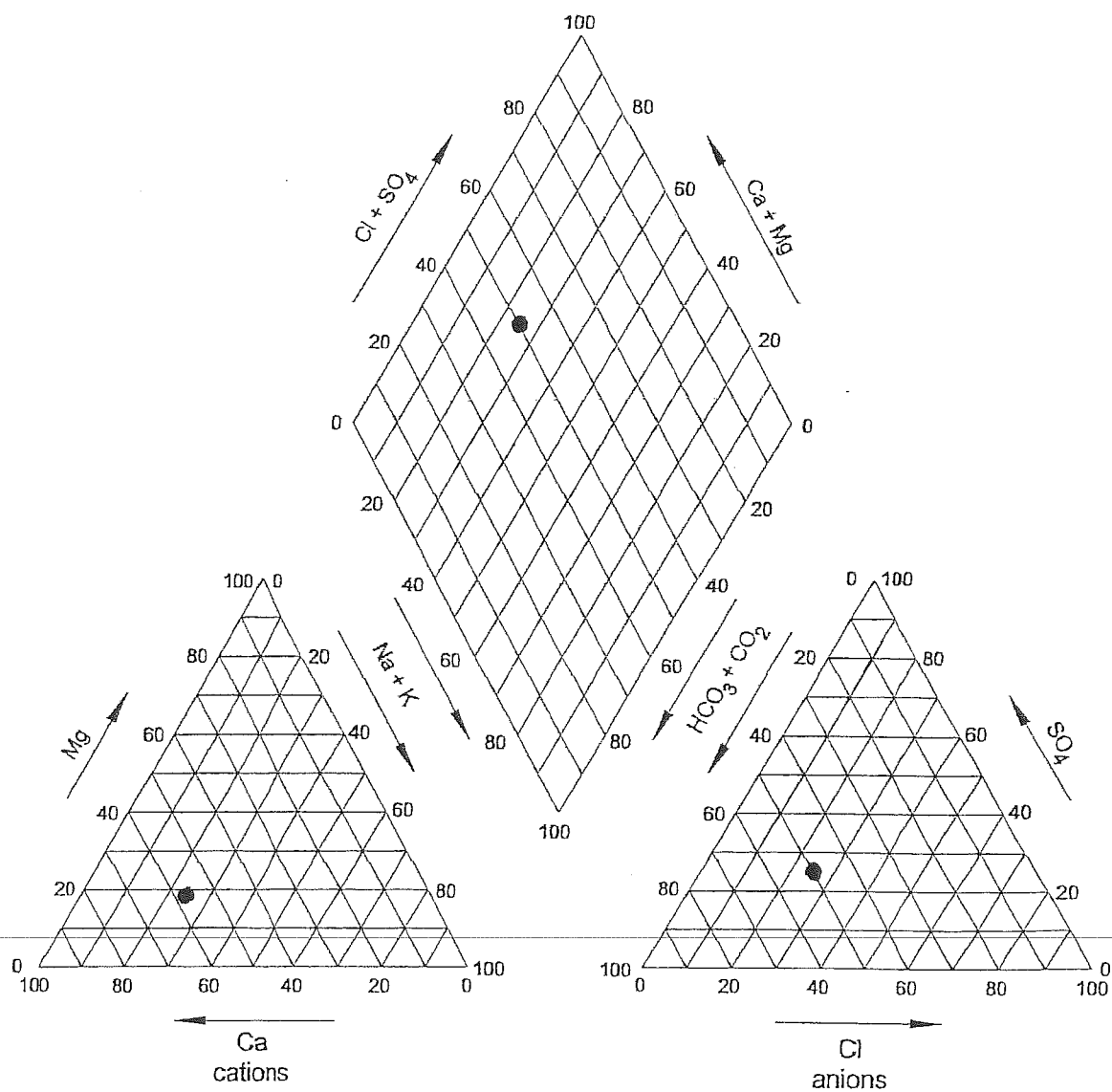
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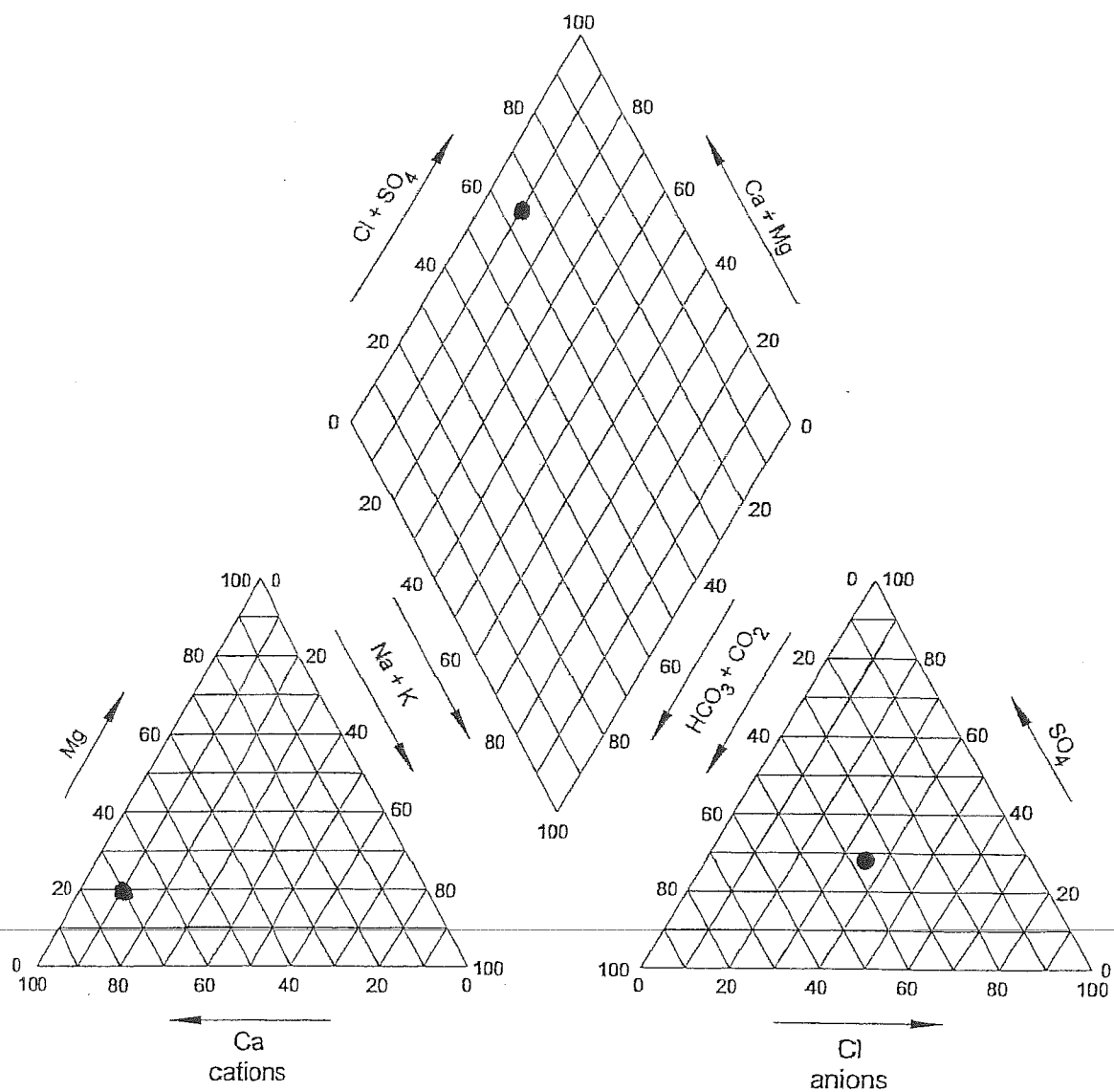
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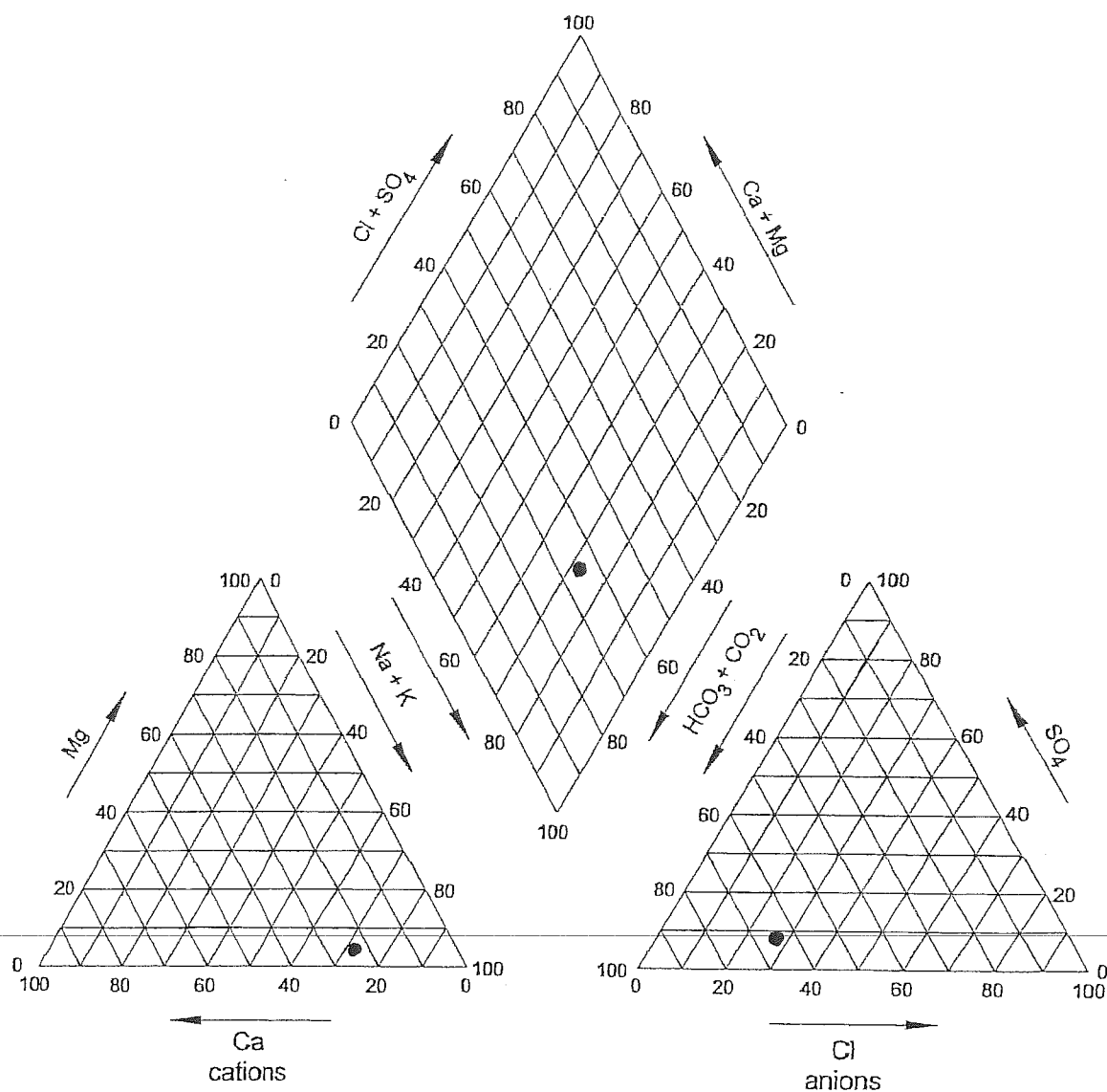
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# 8 Juniper Hill Lp

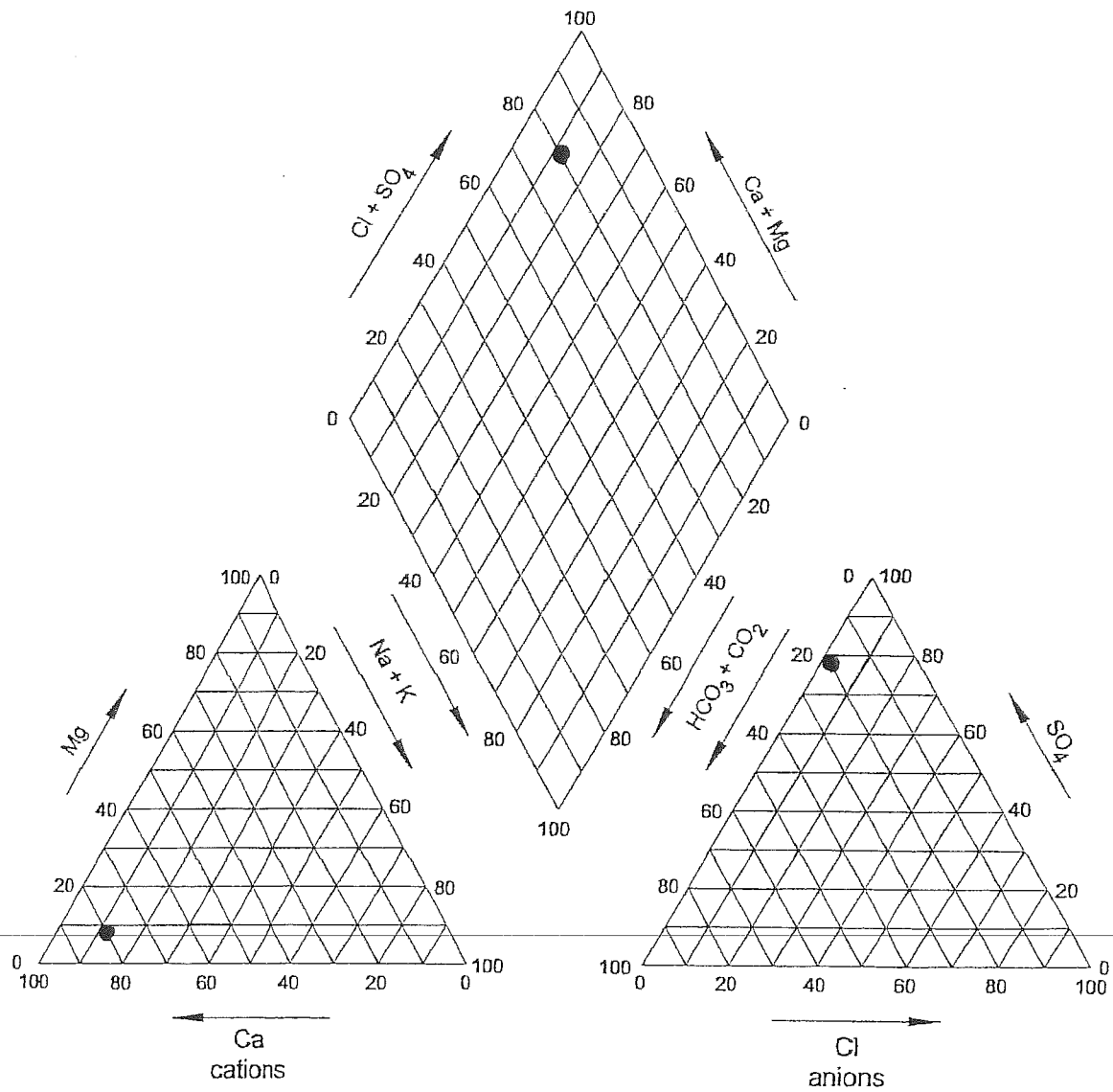


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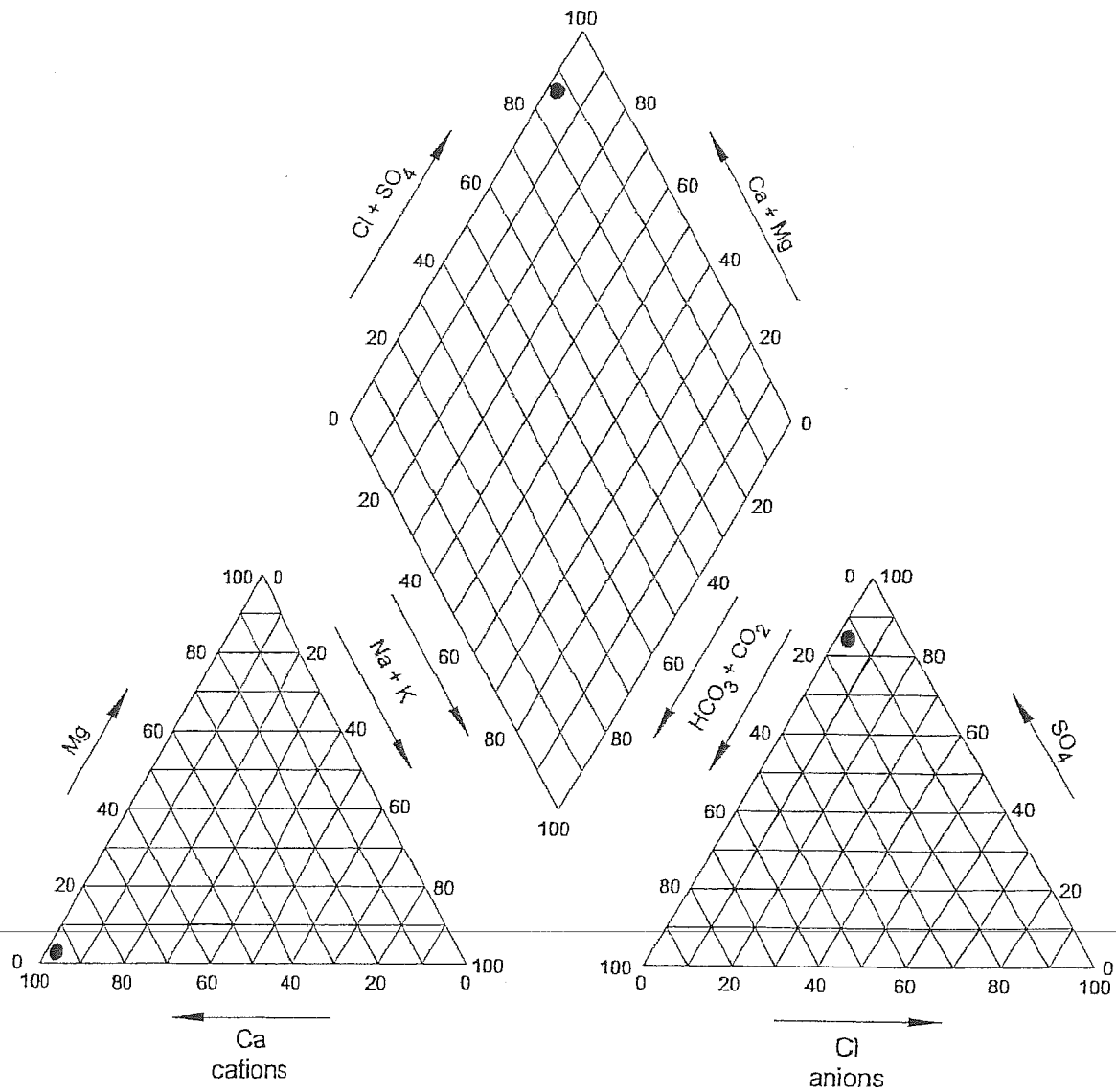


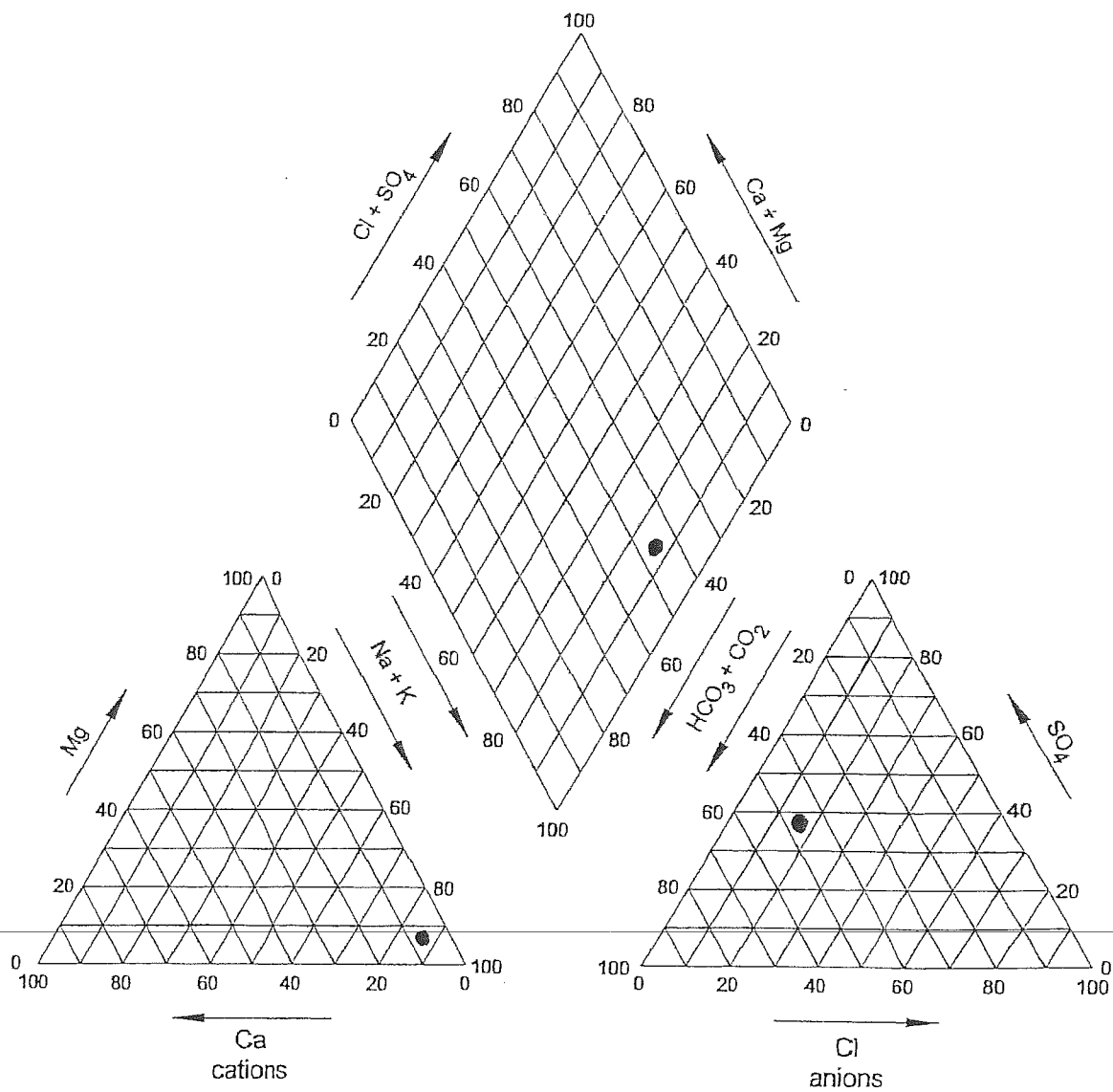


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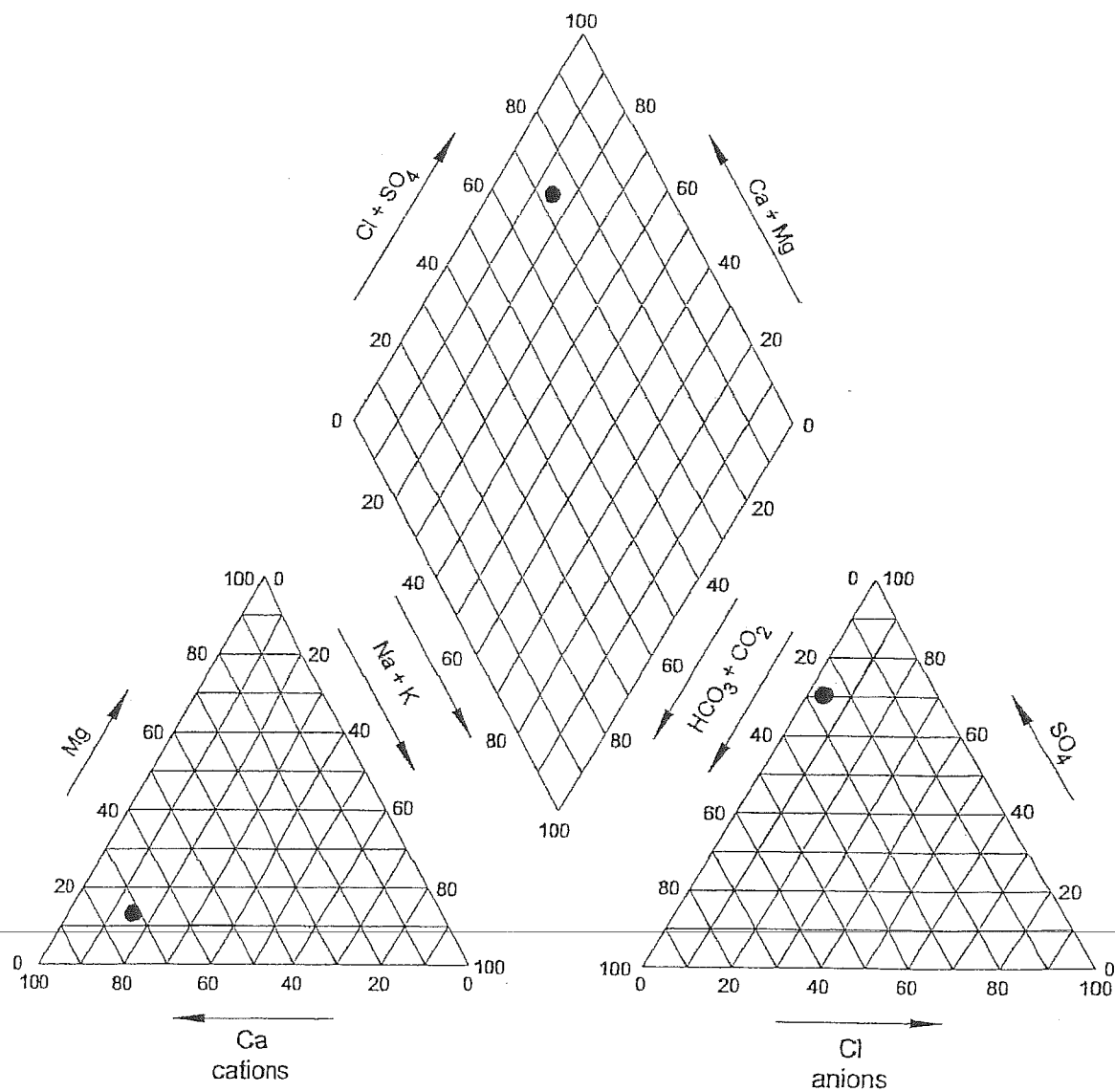


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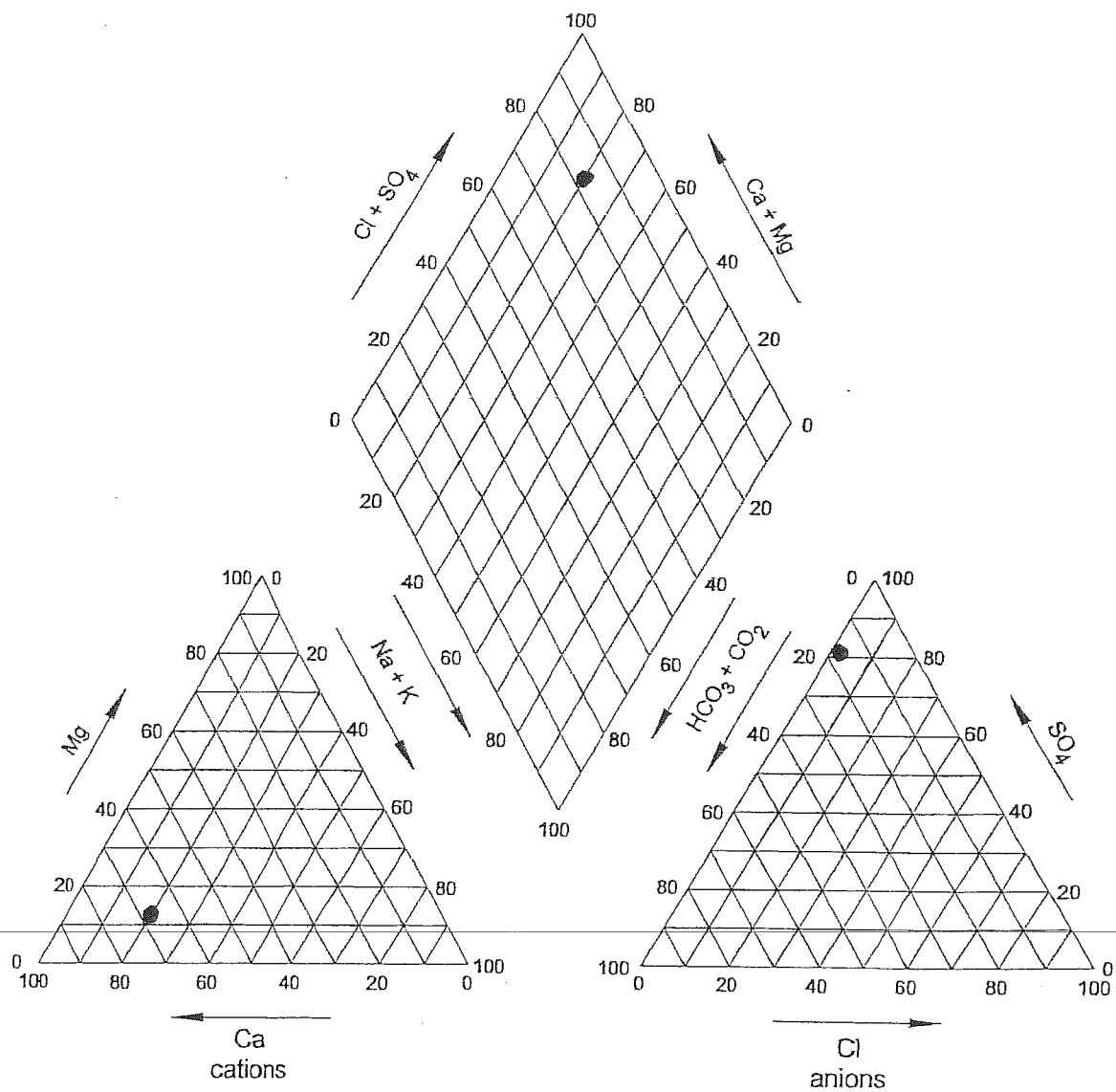




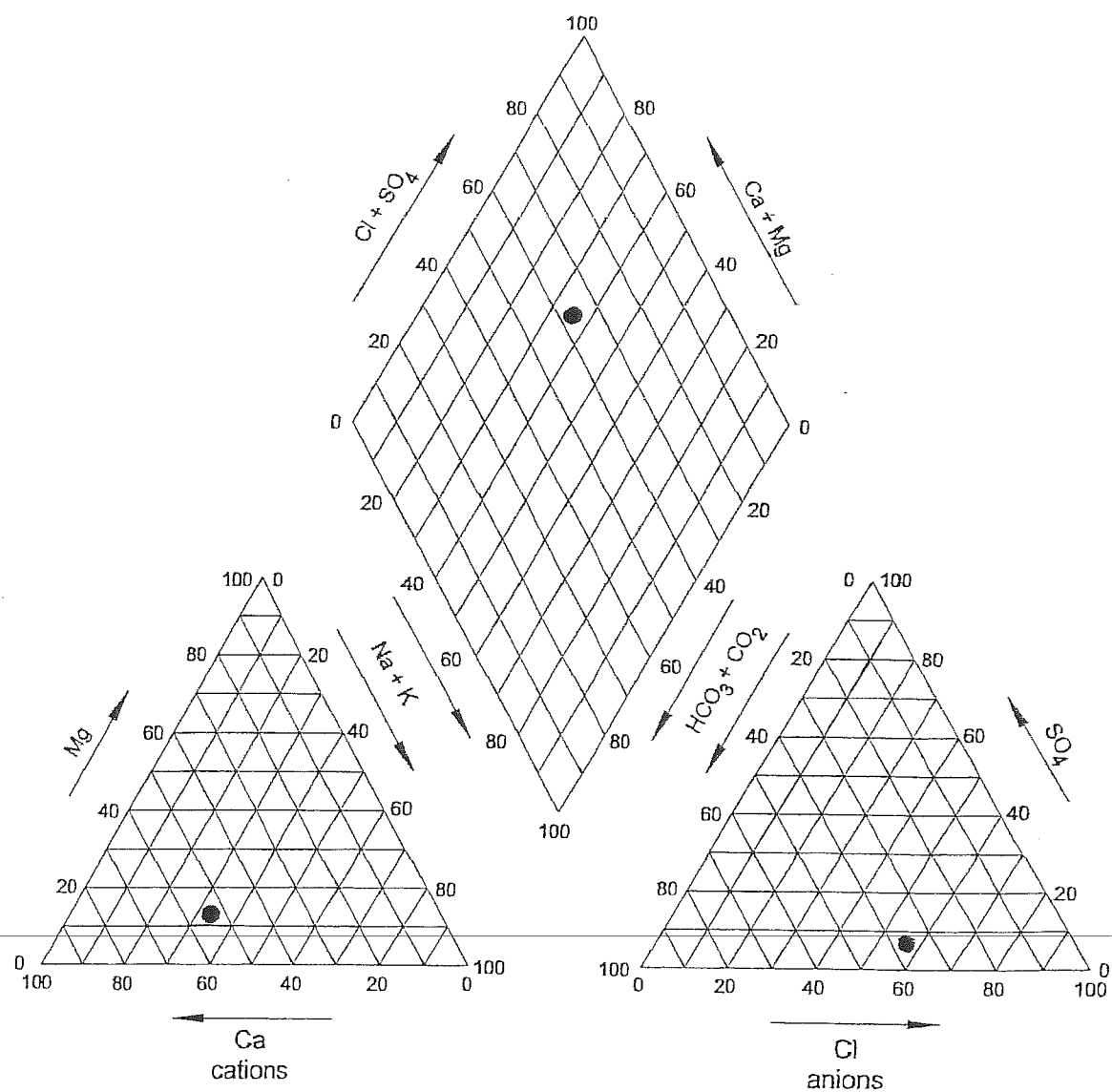
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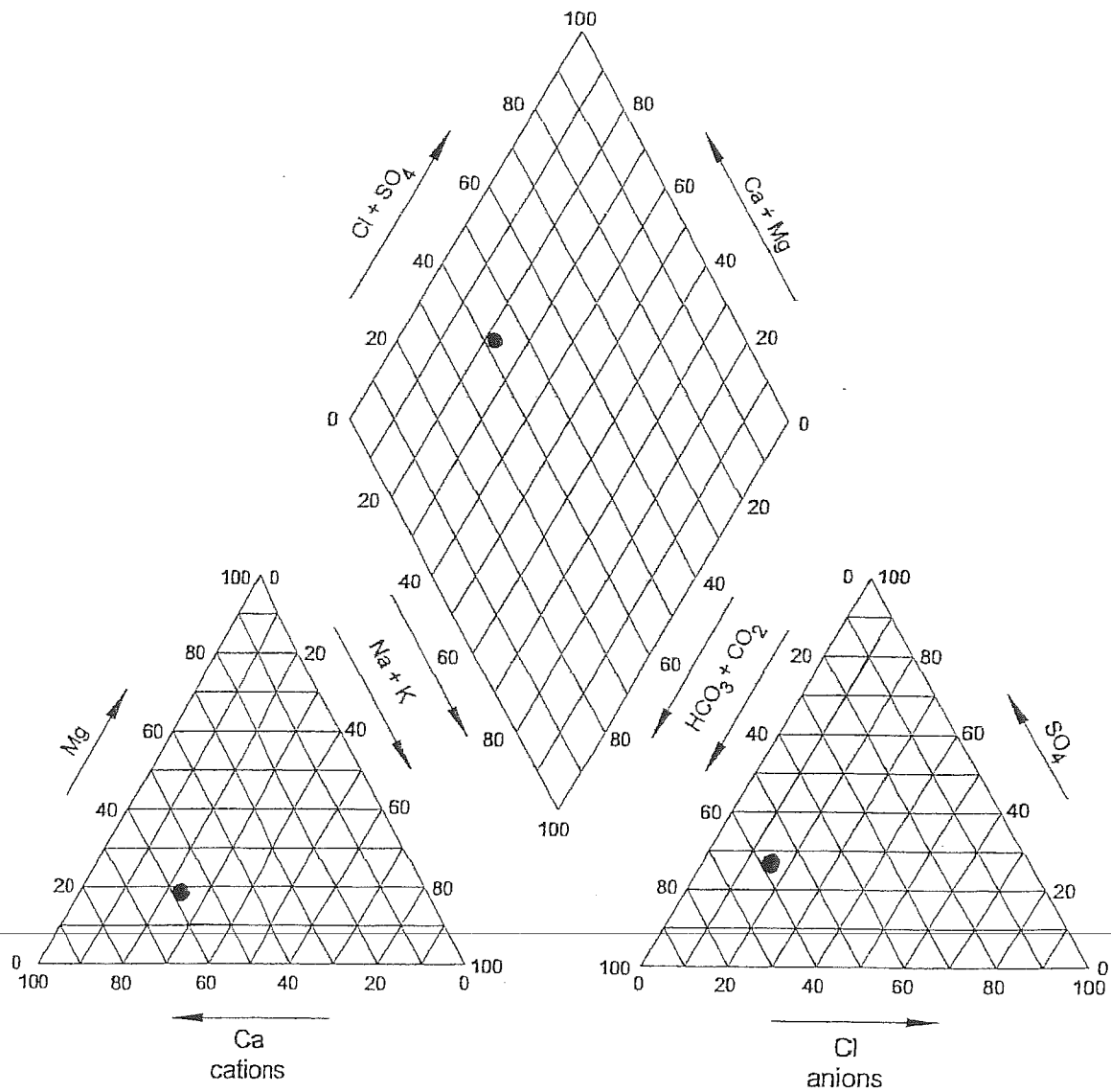
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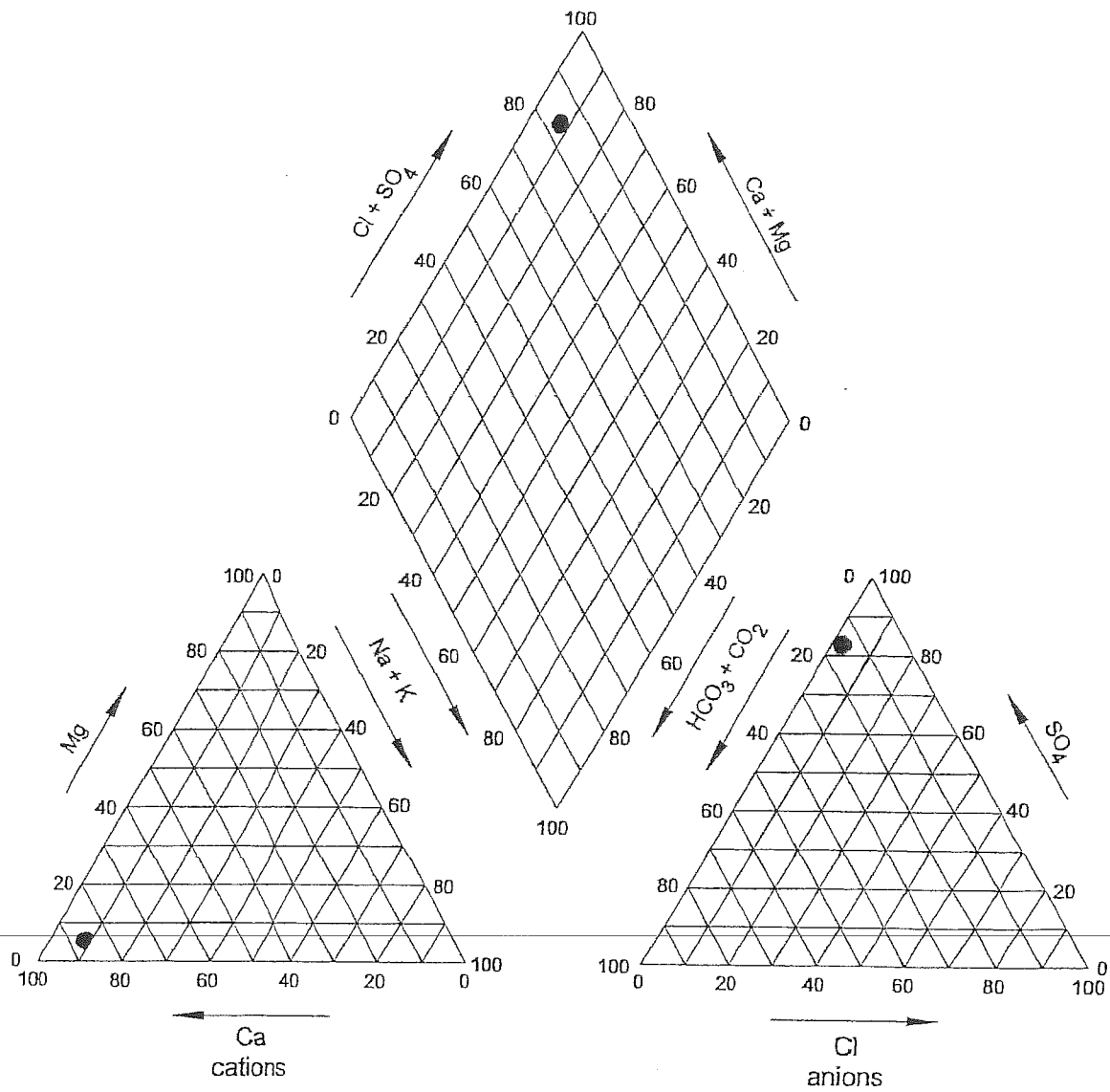
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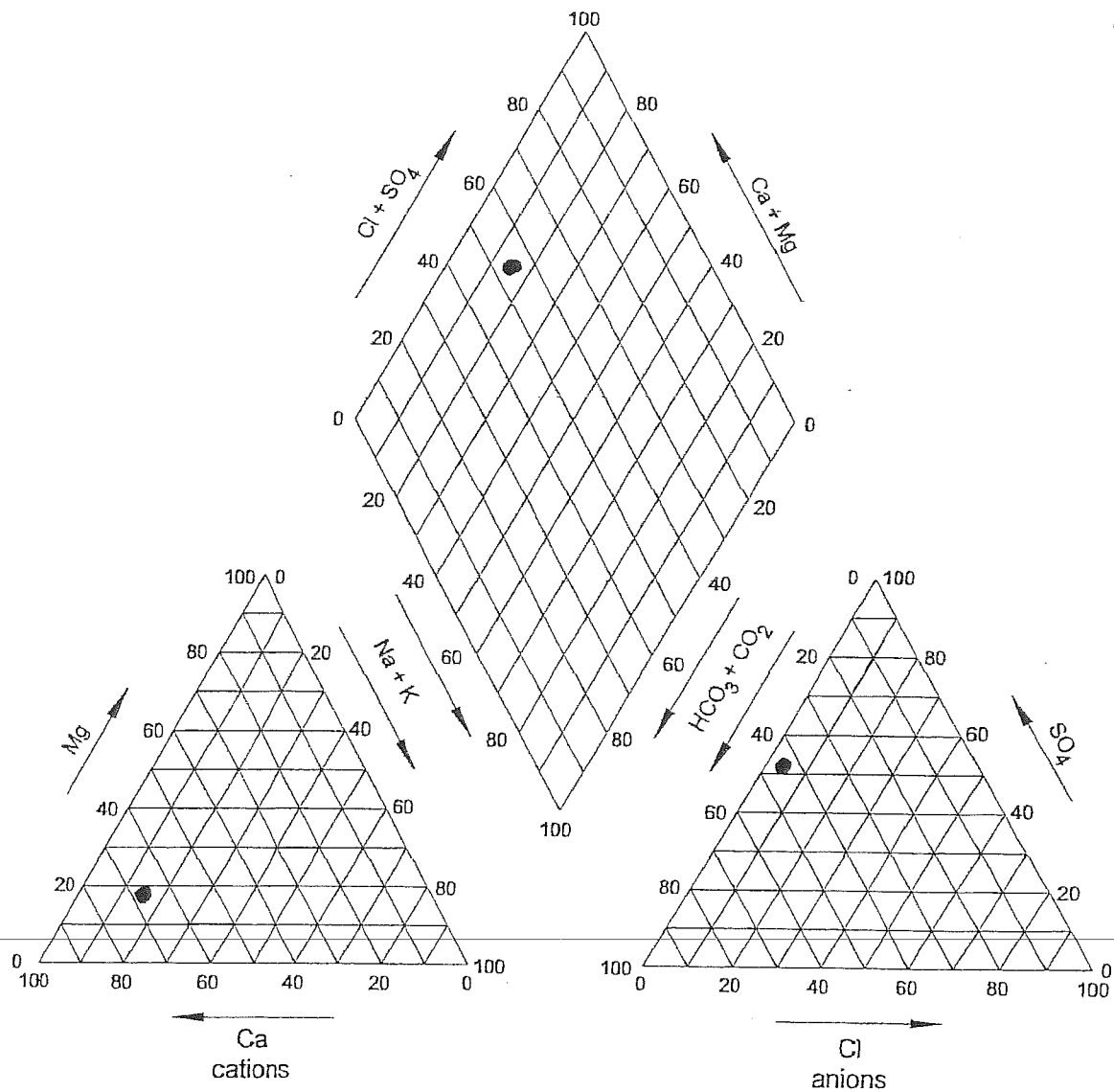


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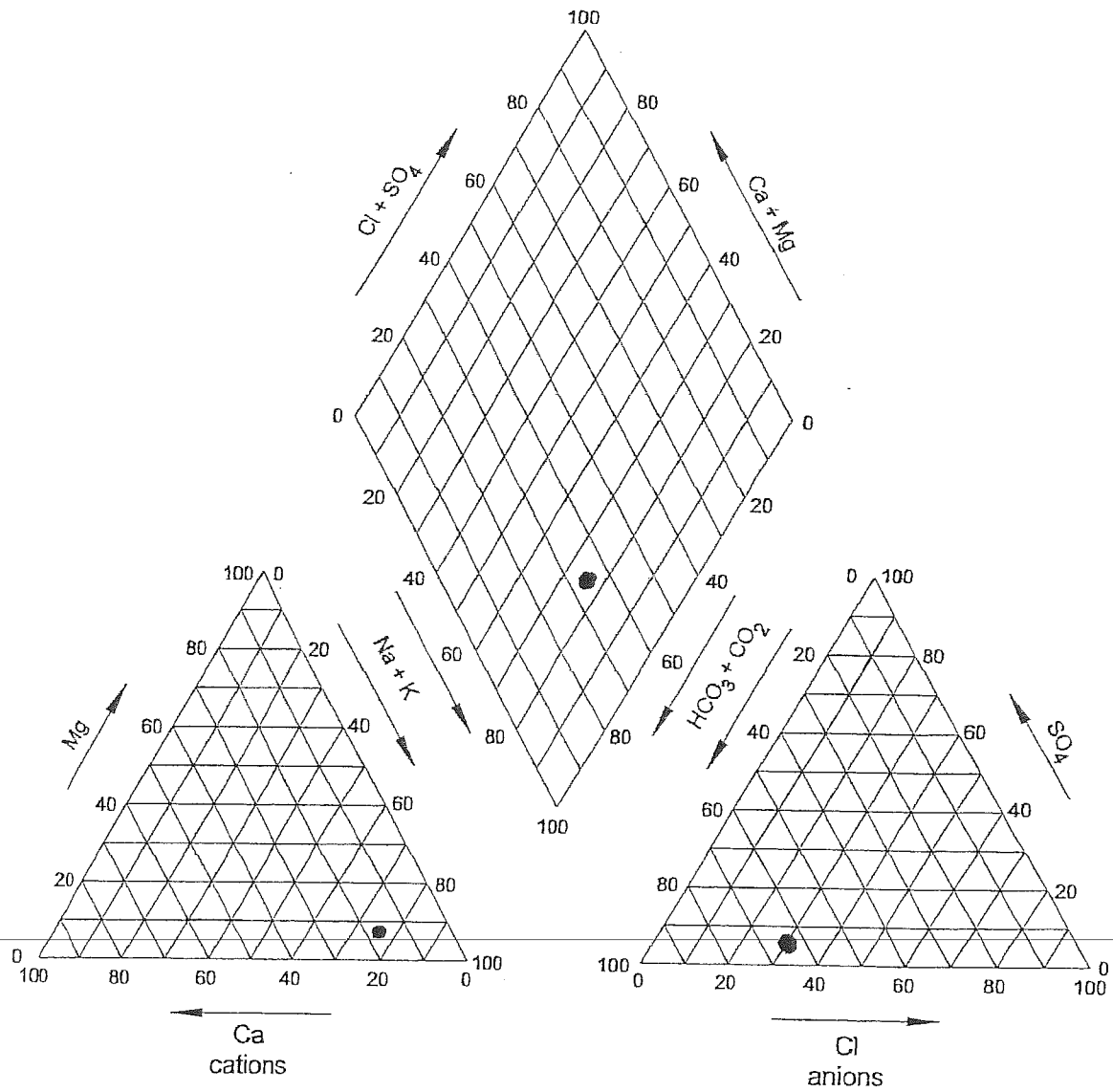


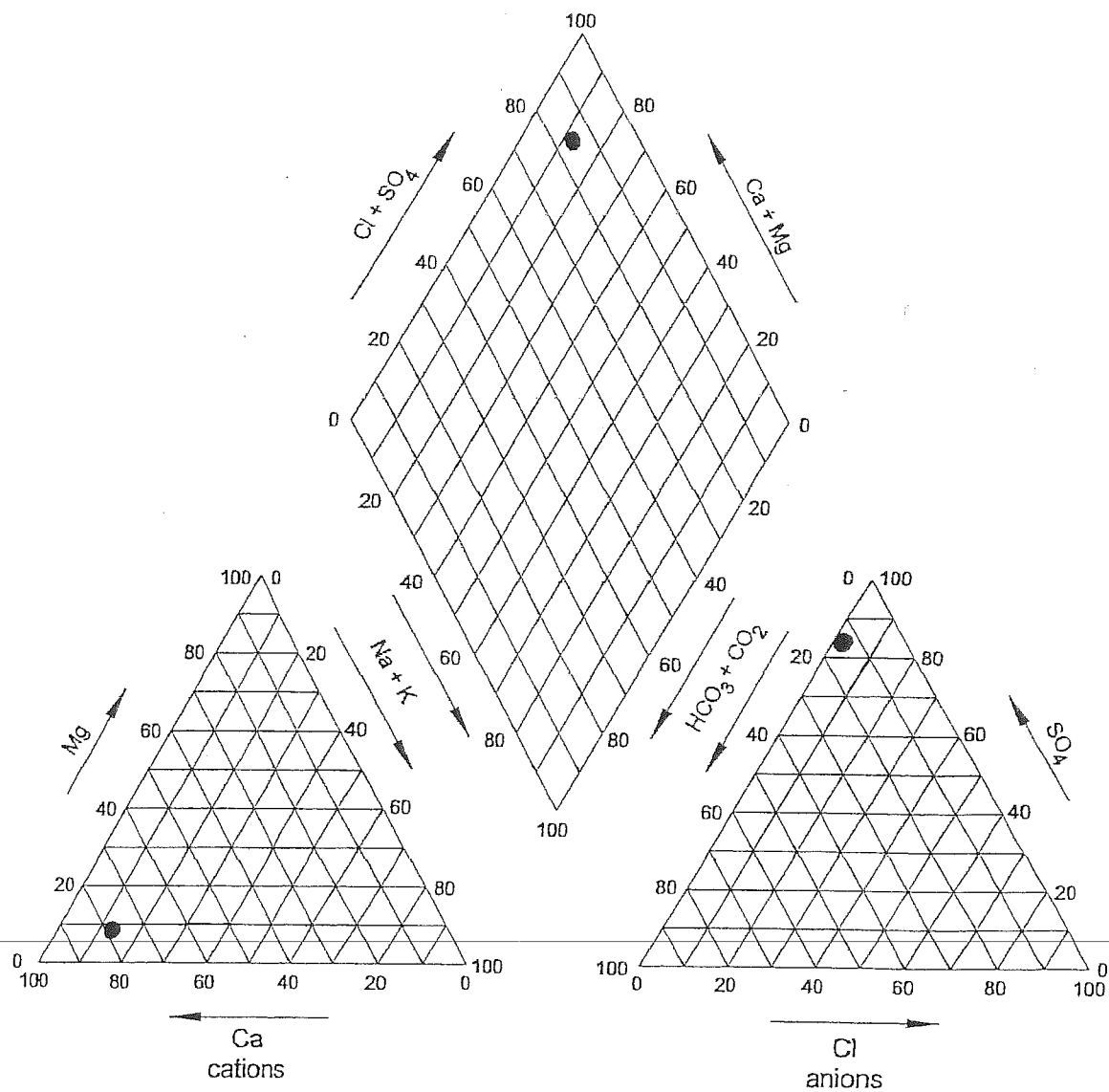


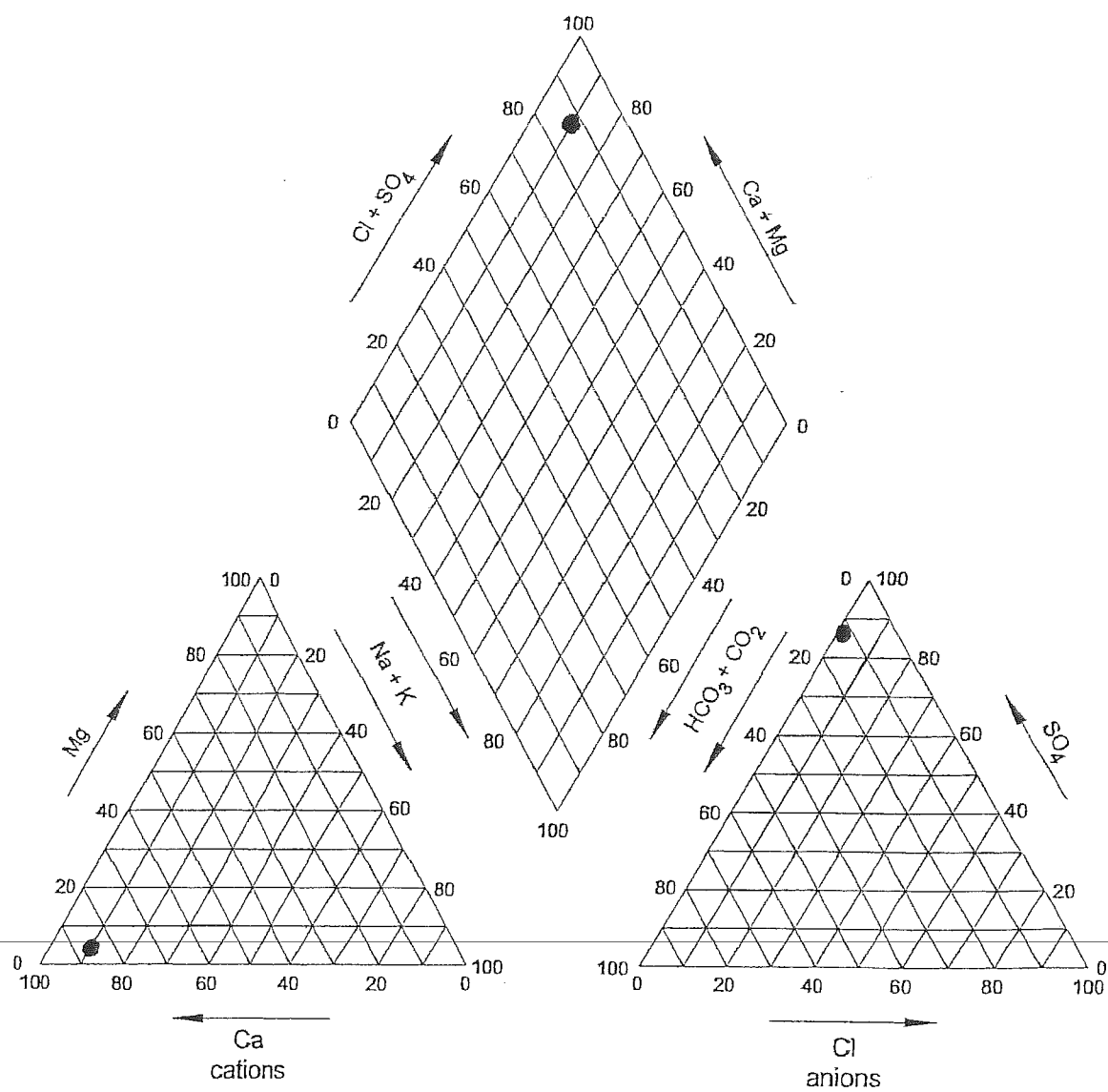
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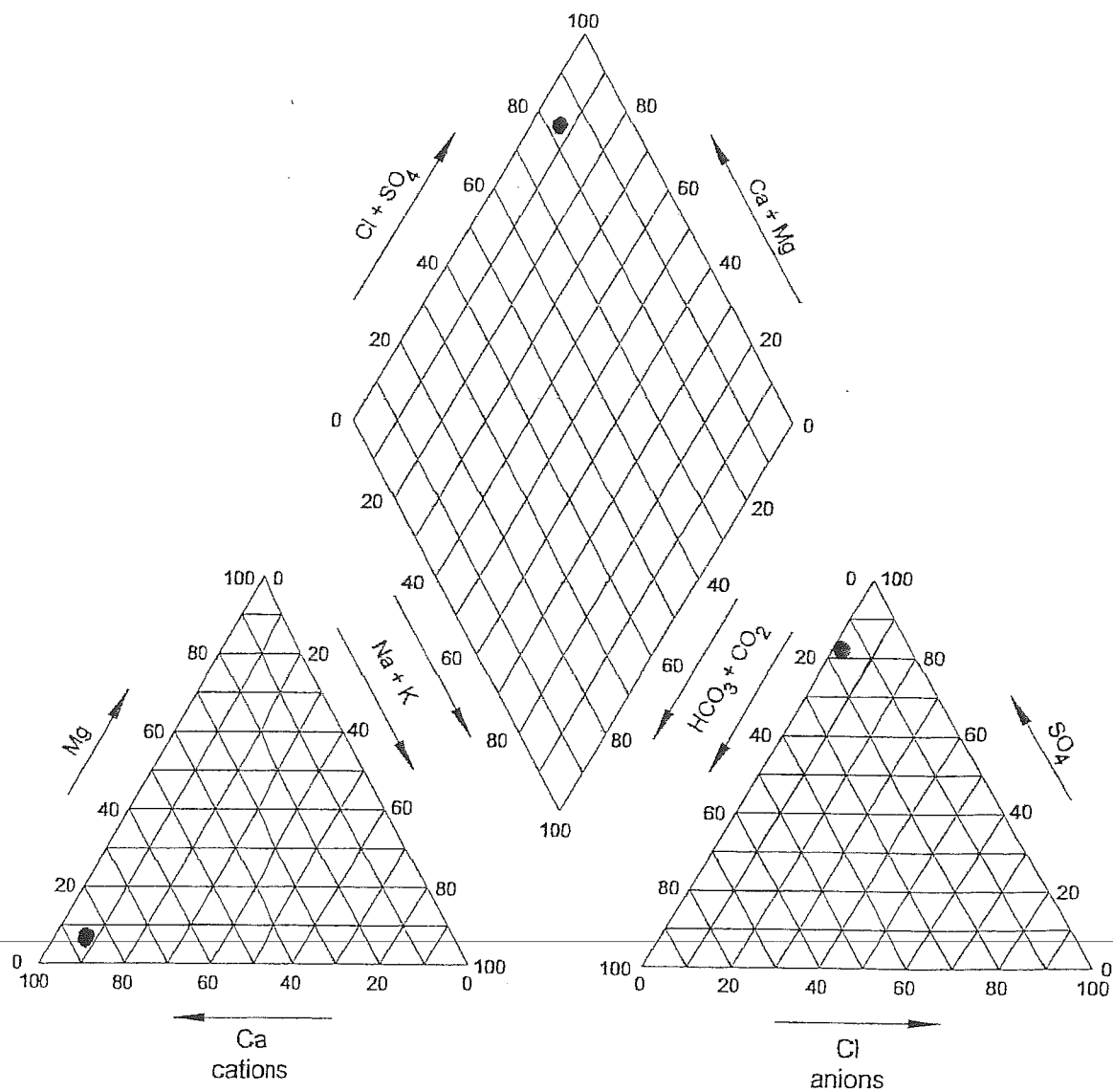
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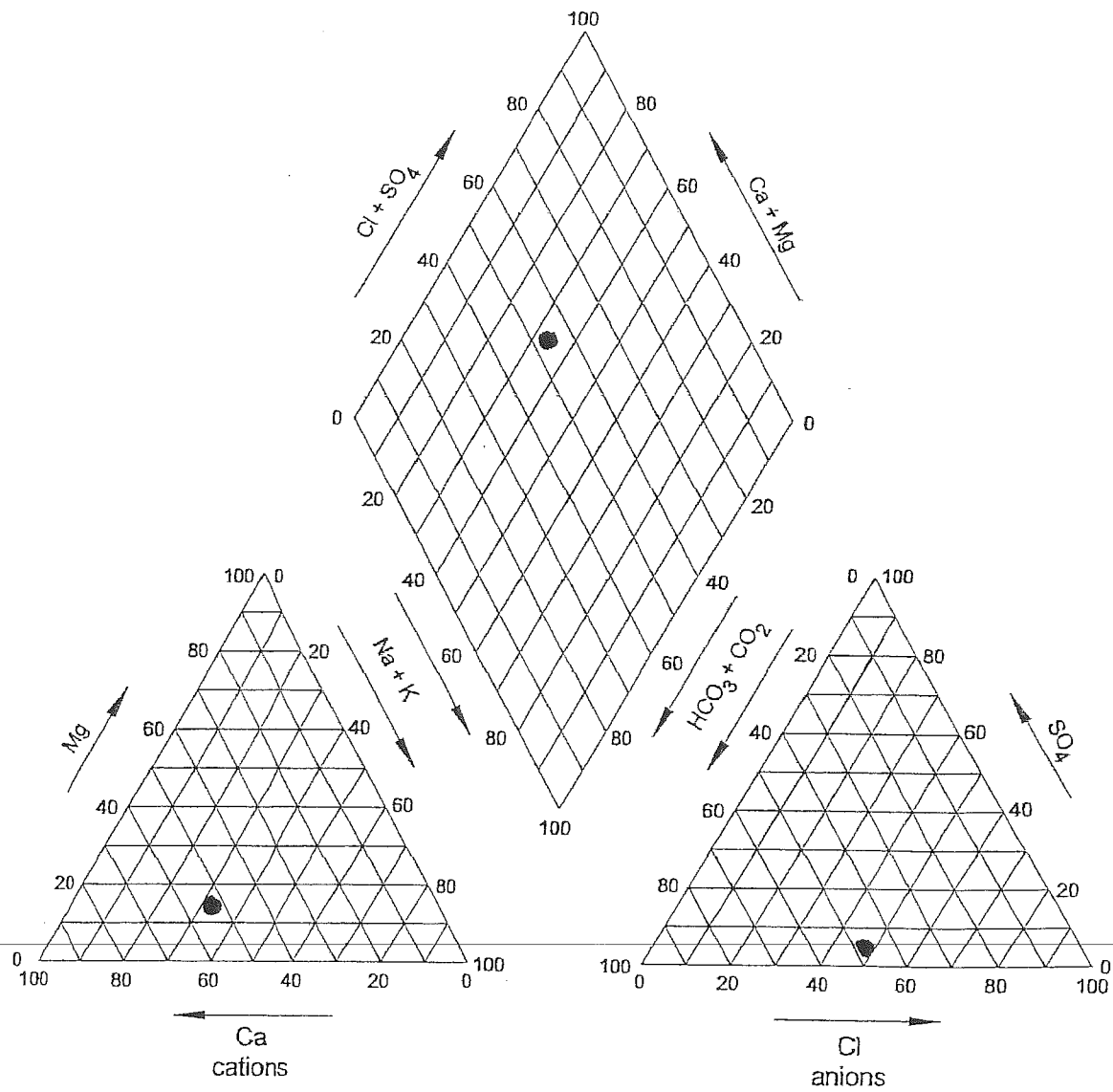




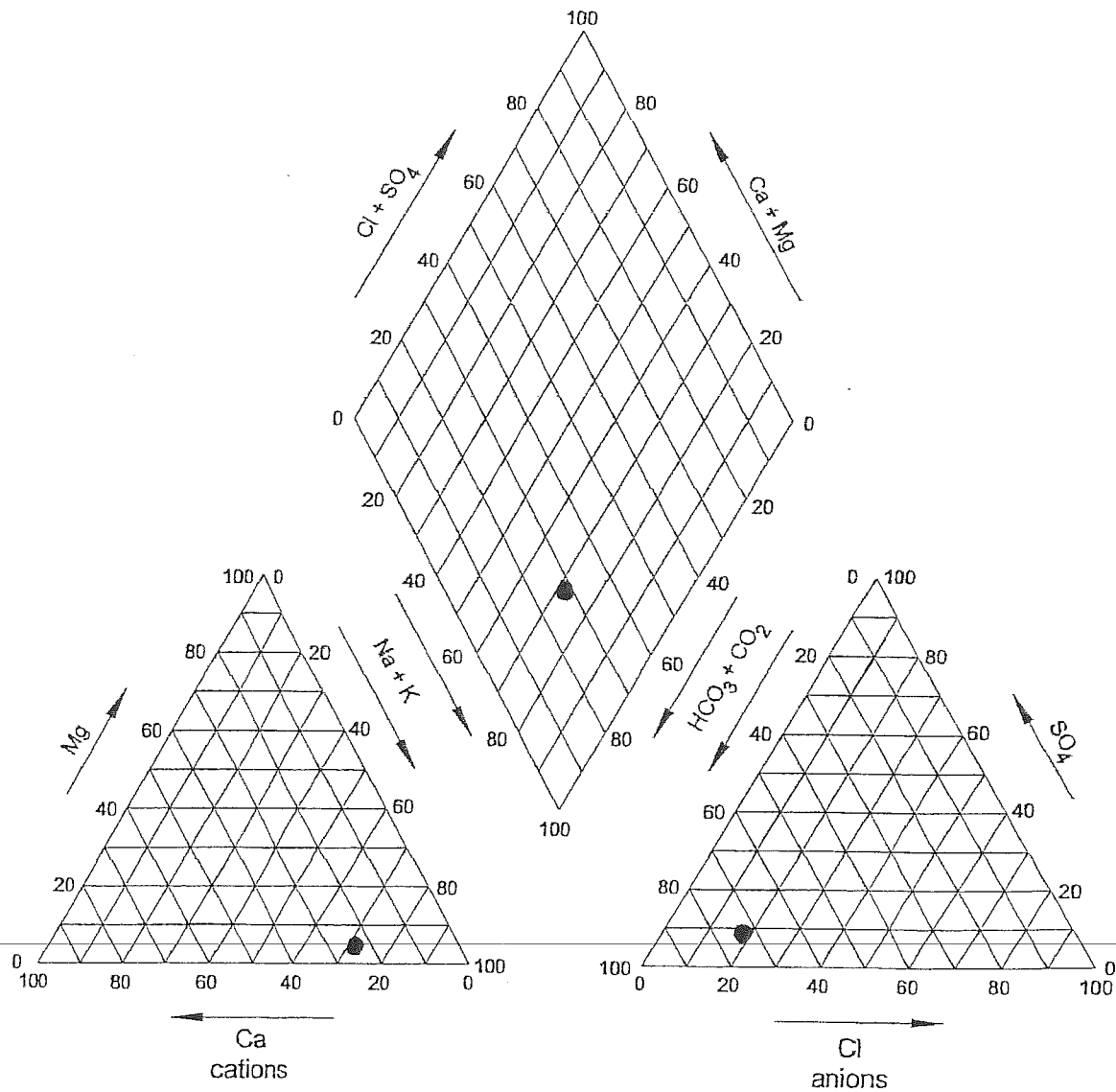
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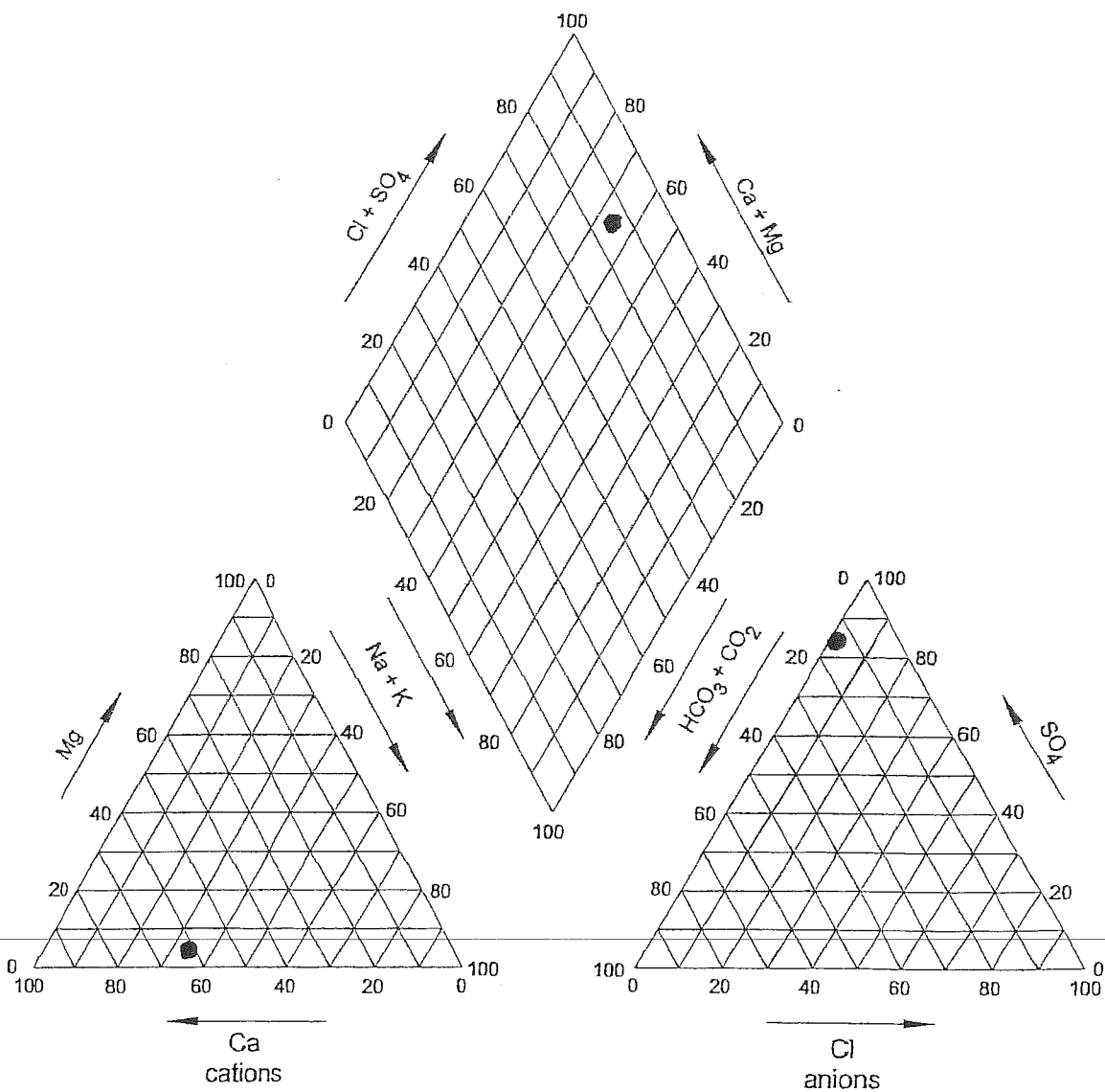
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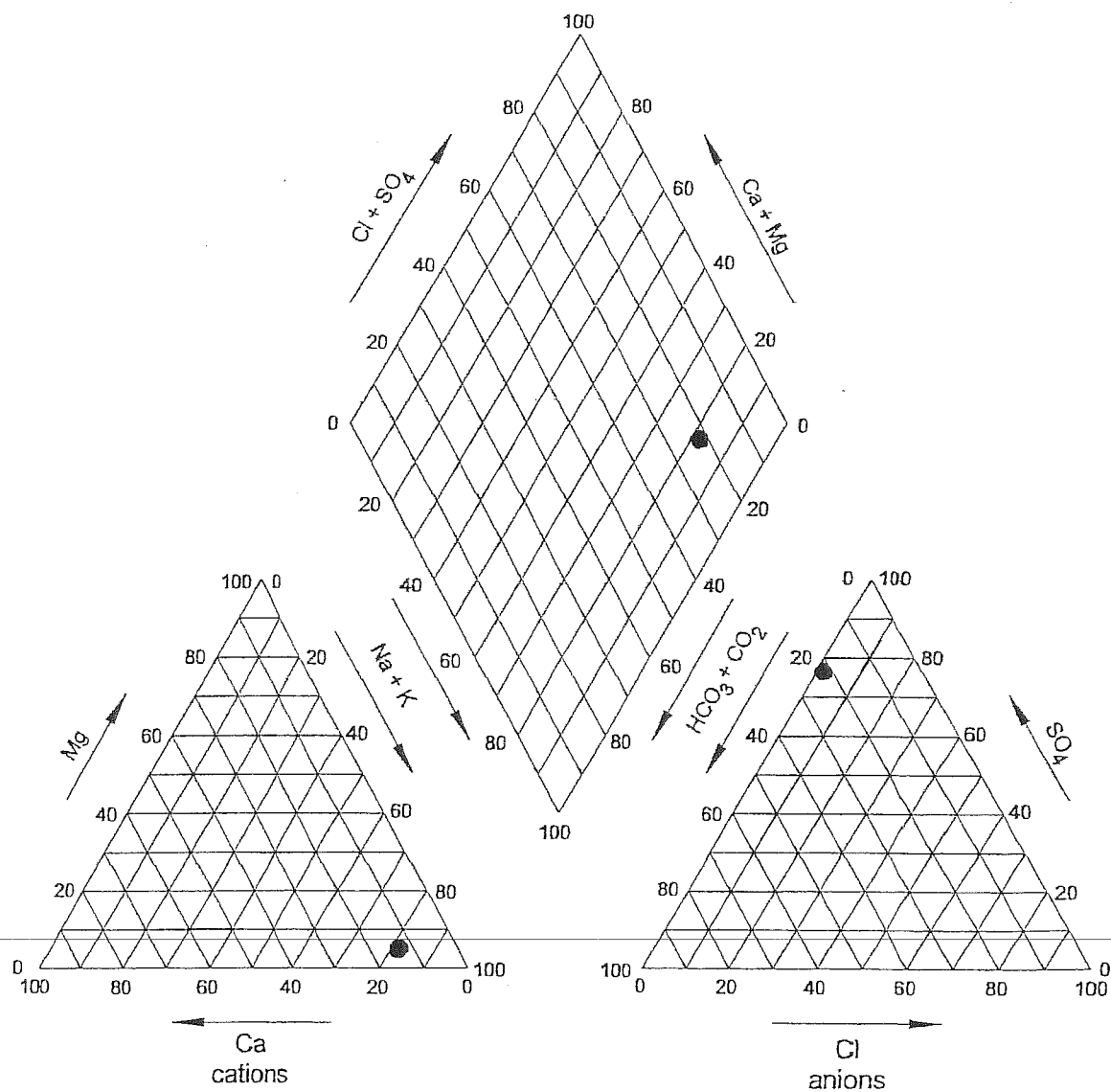


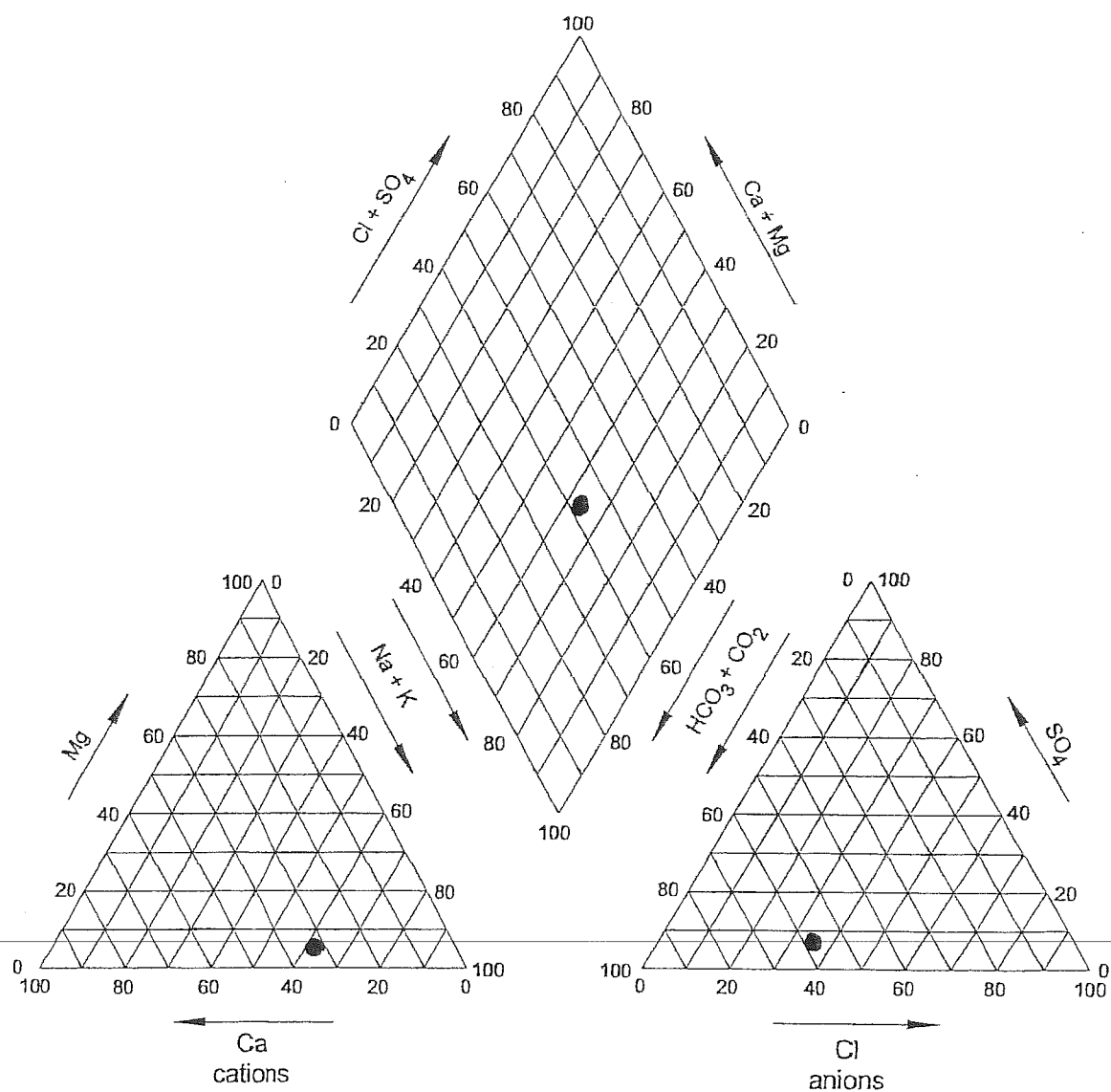
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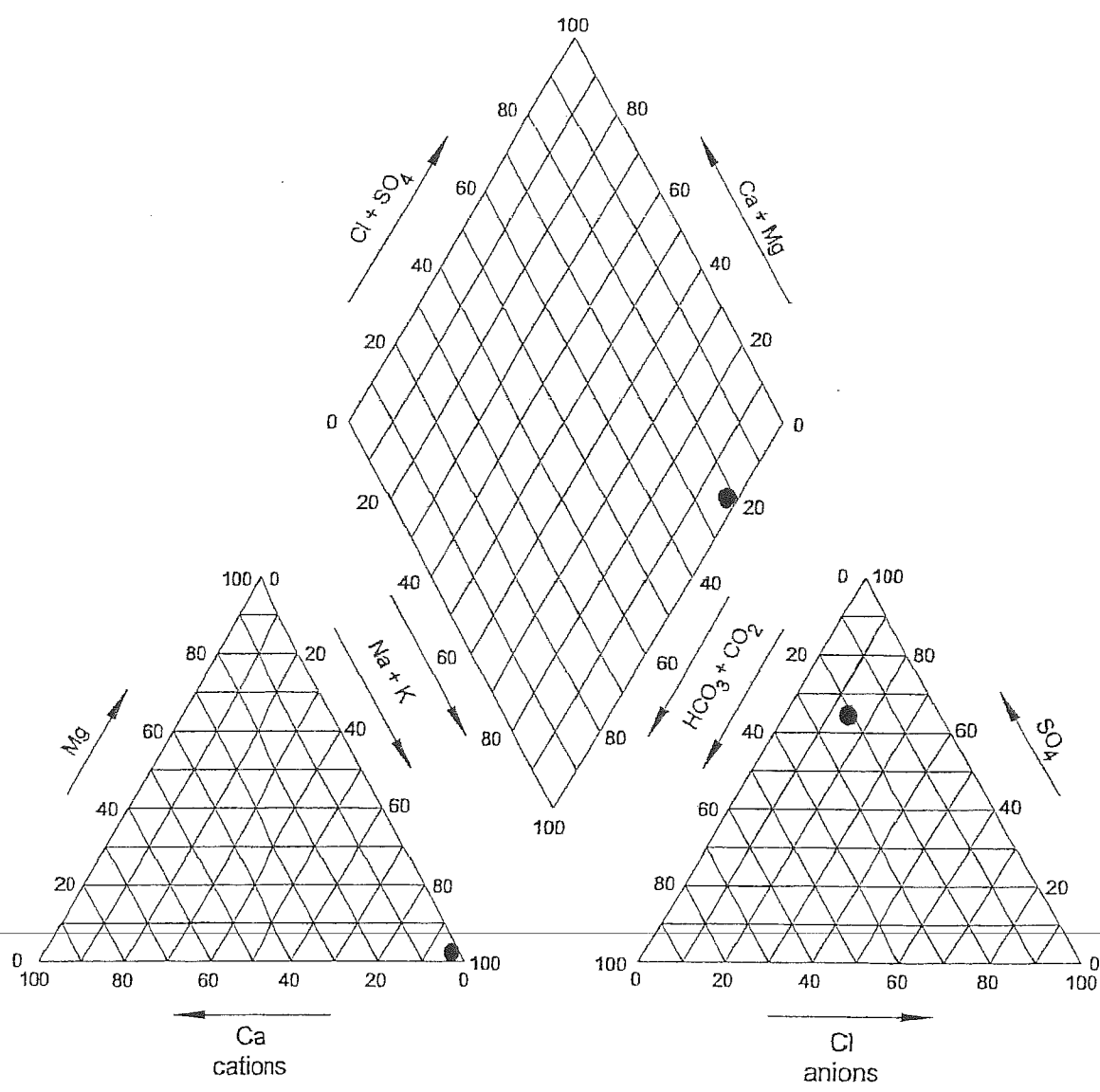




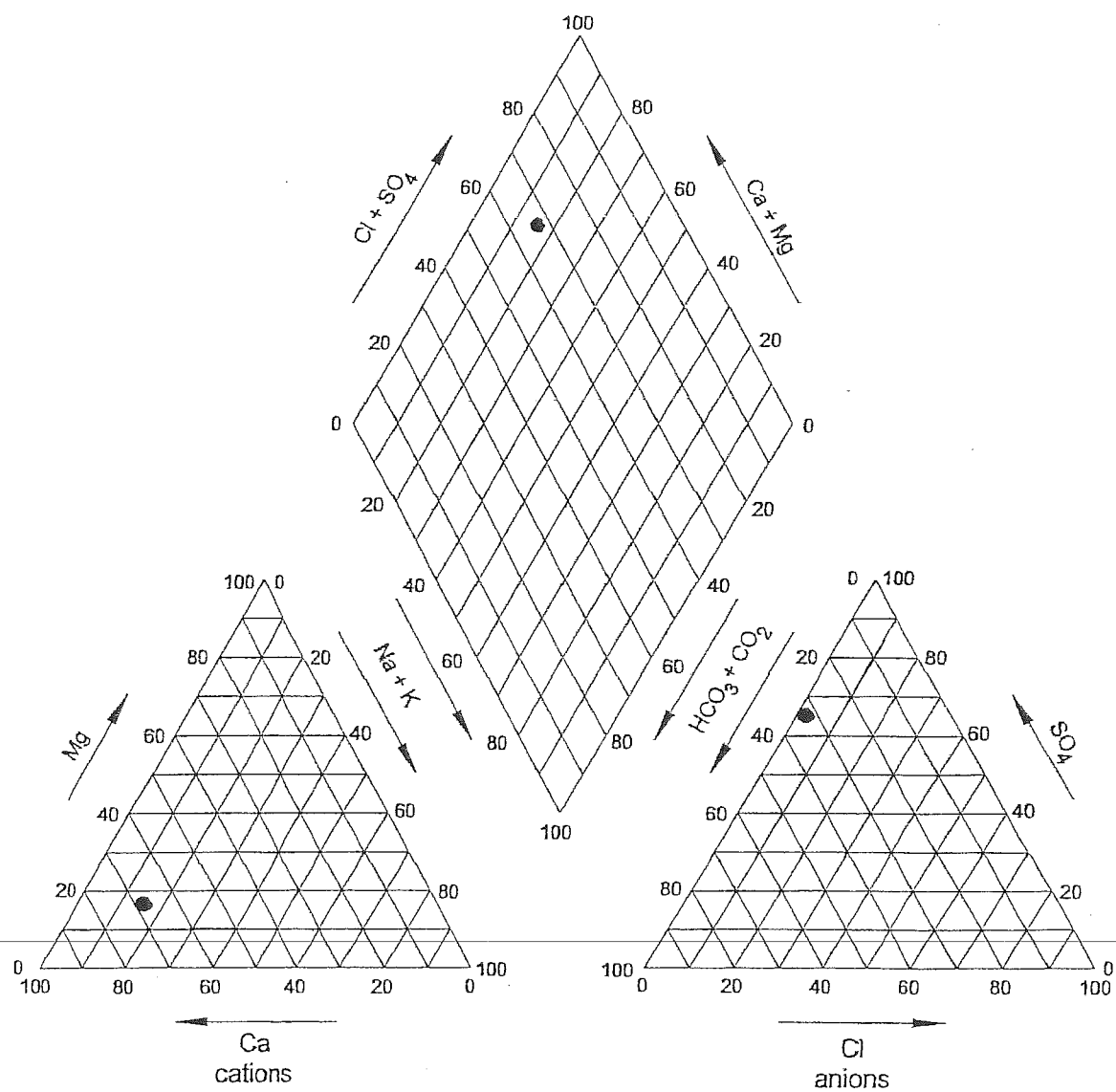
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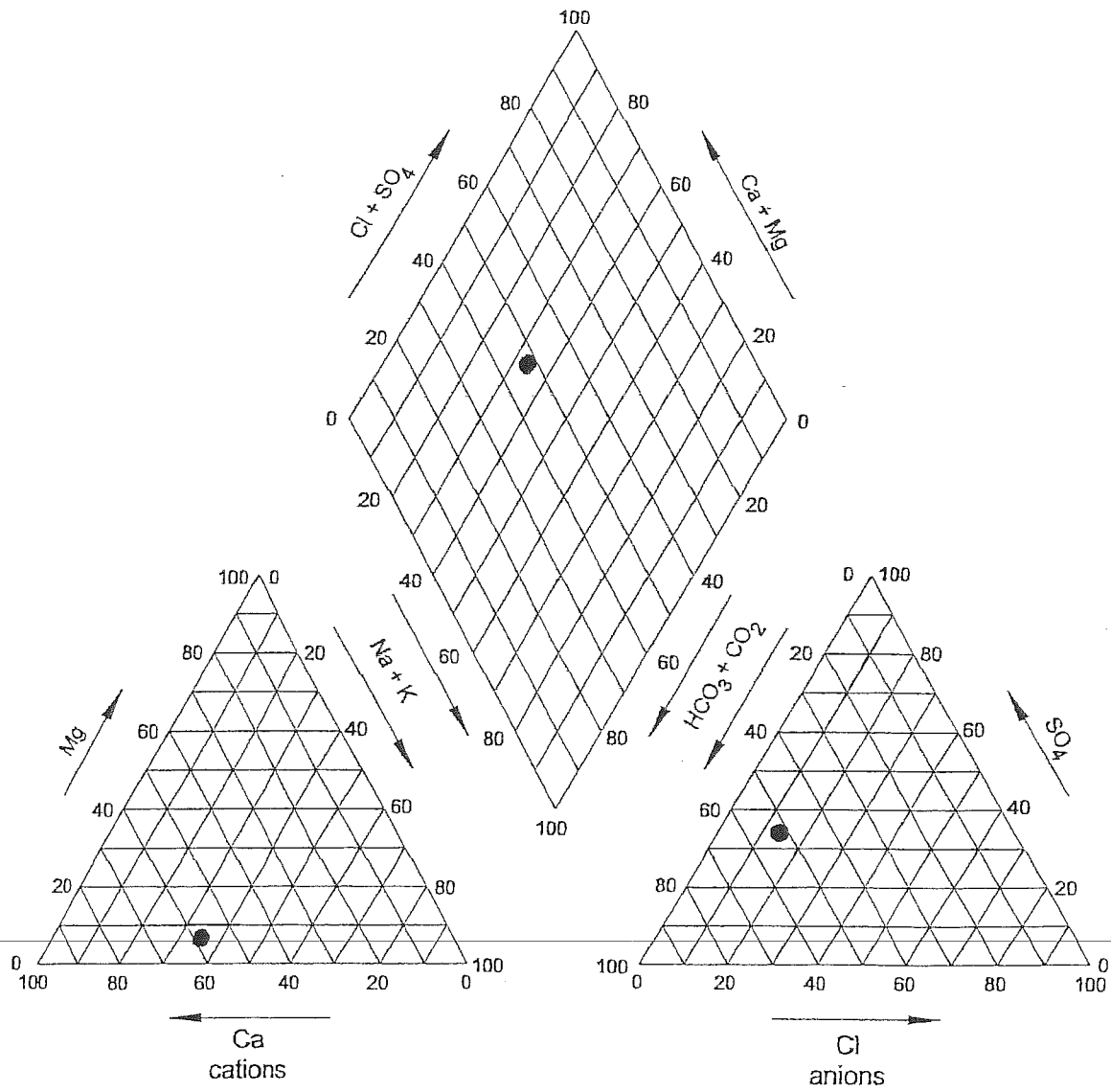




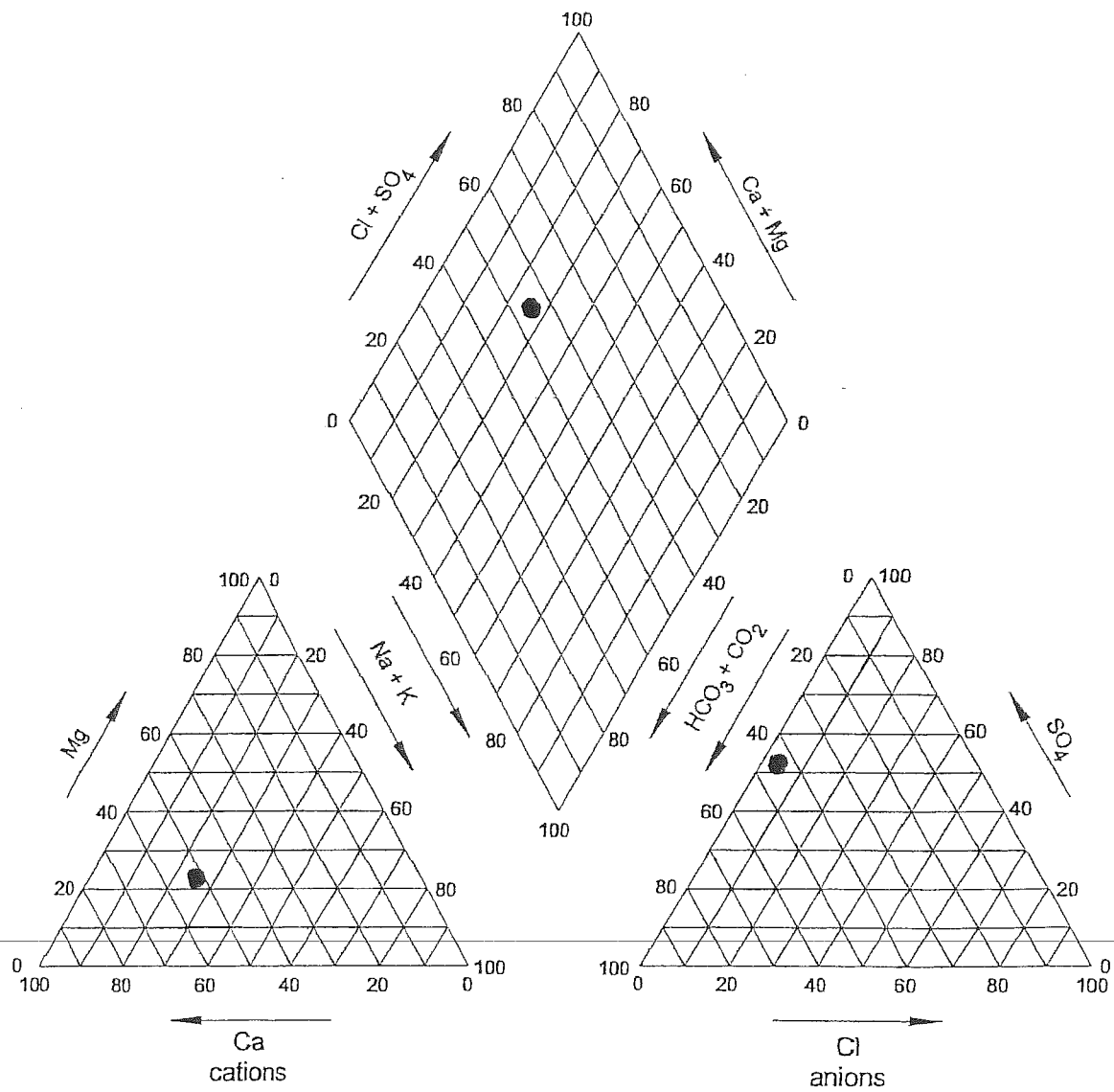
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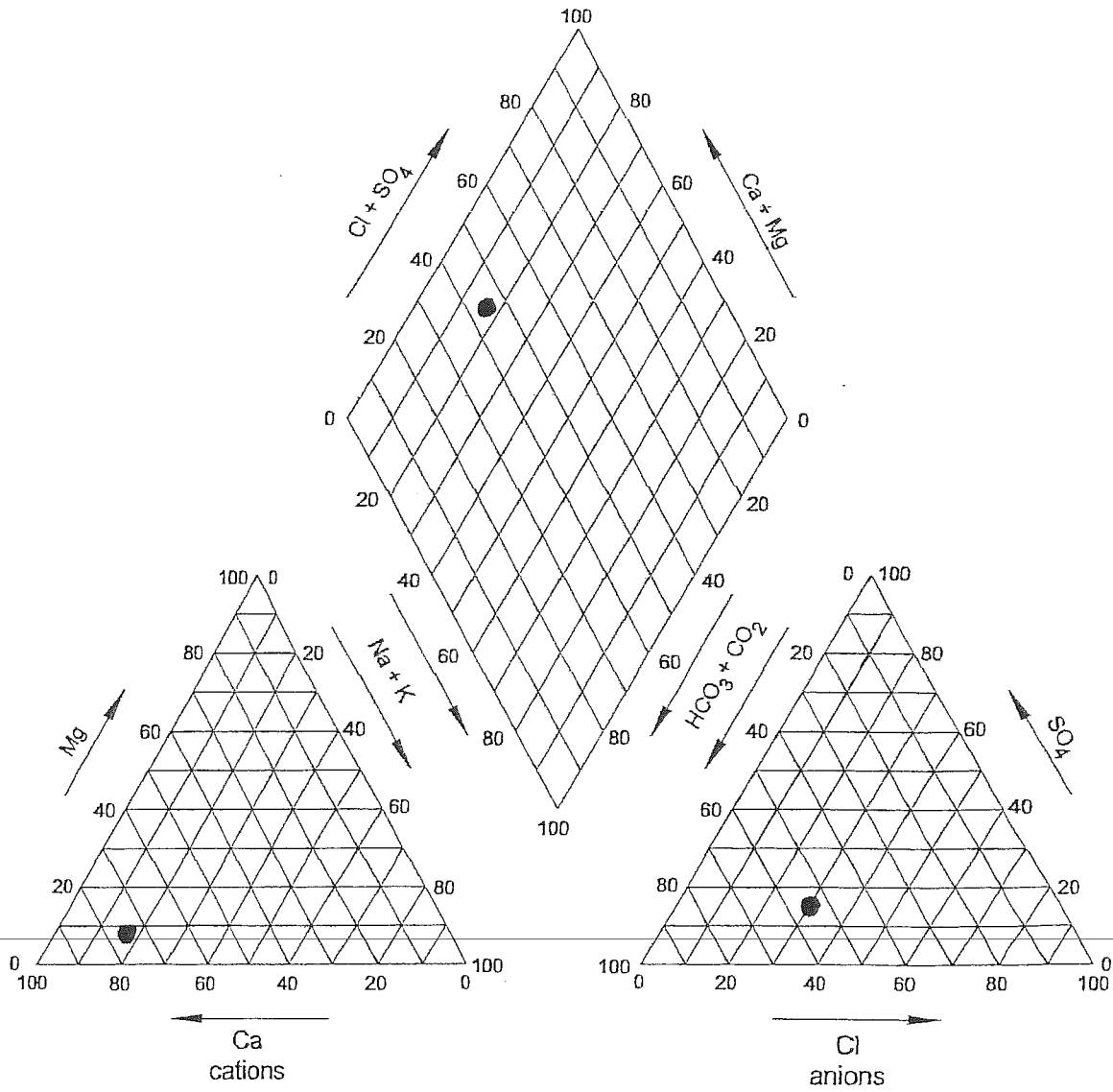


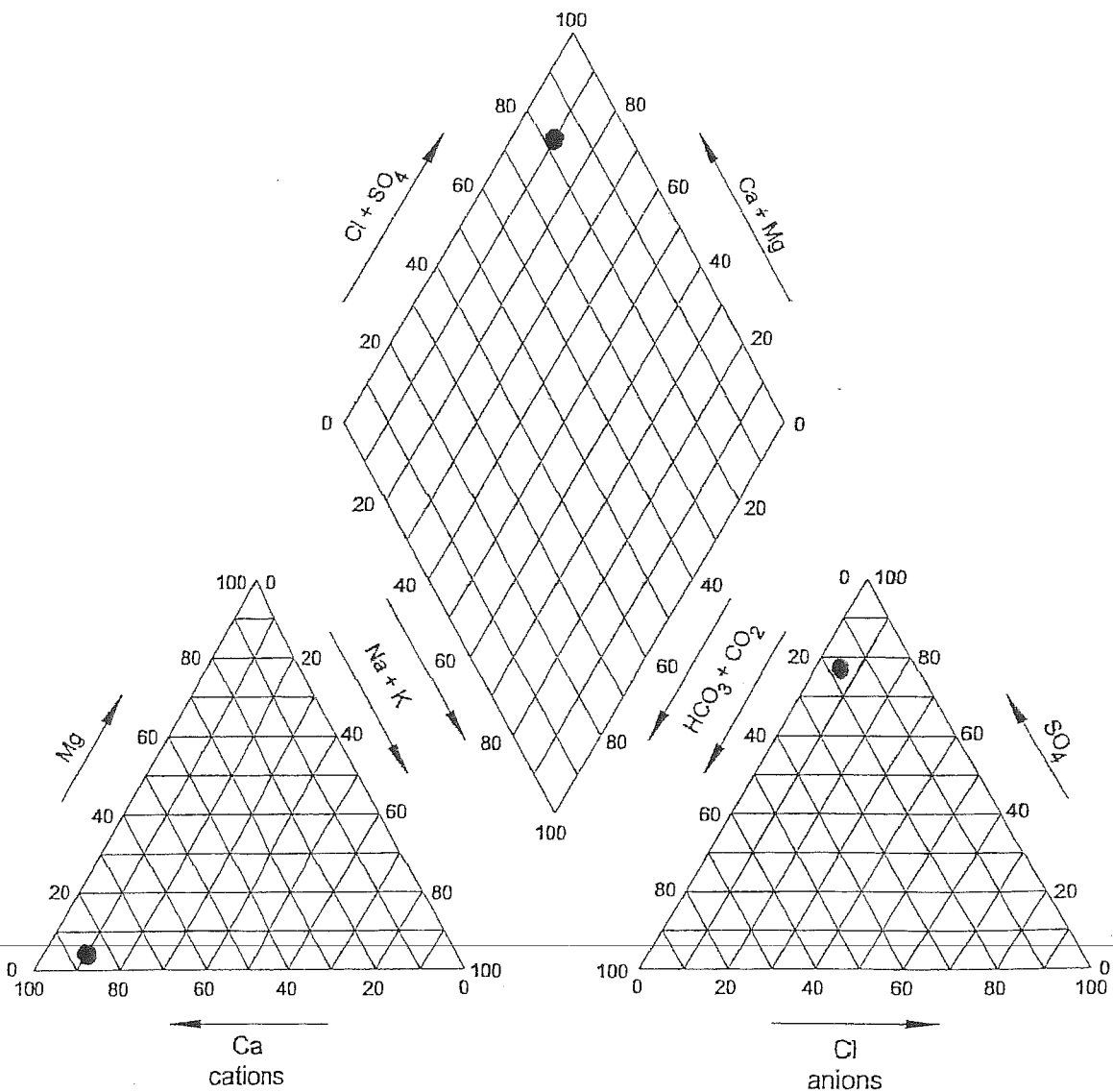
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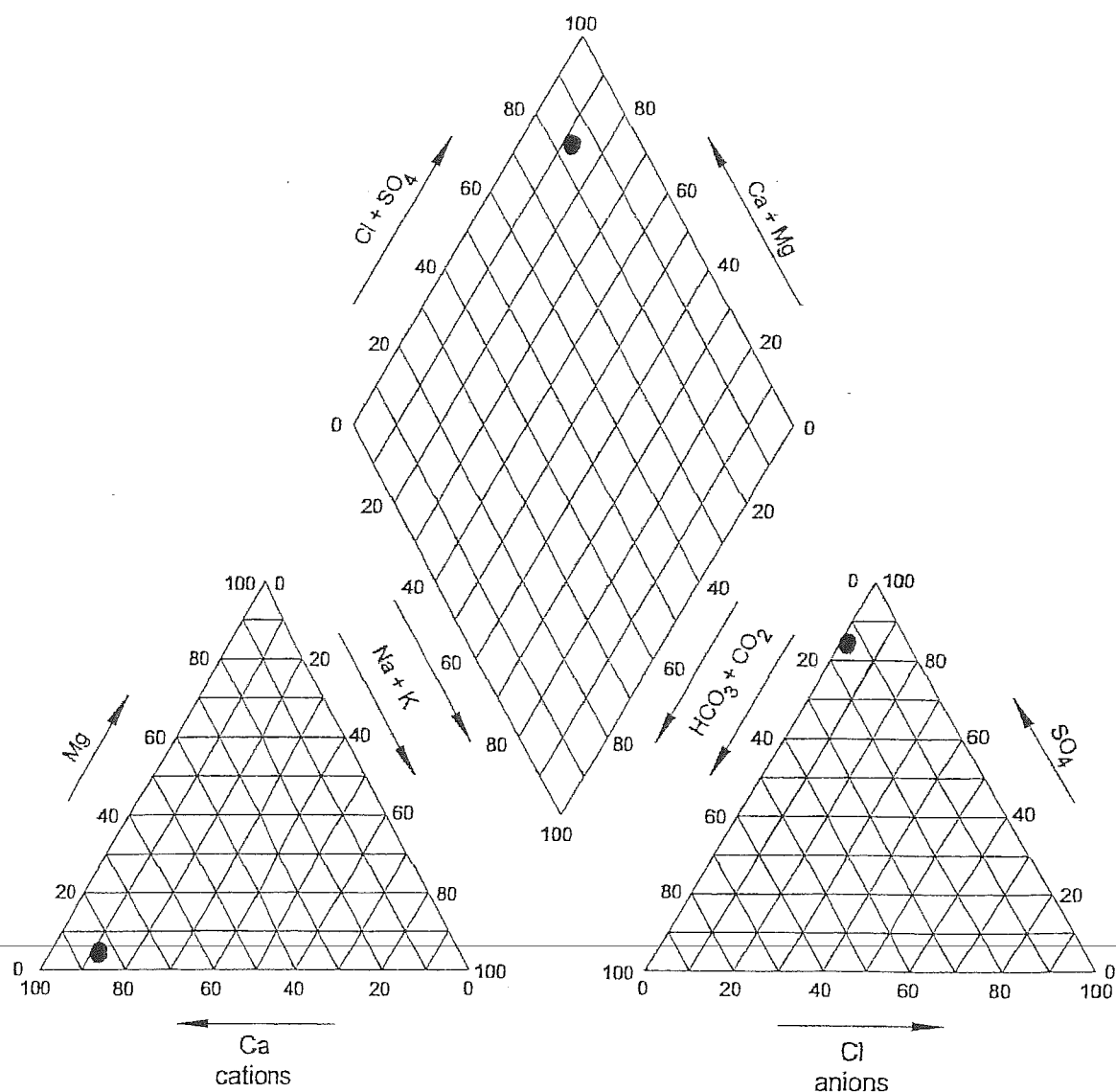




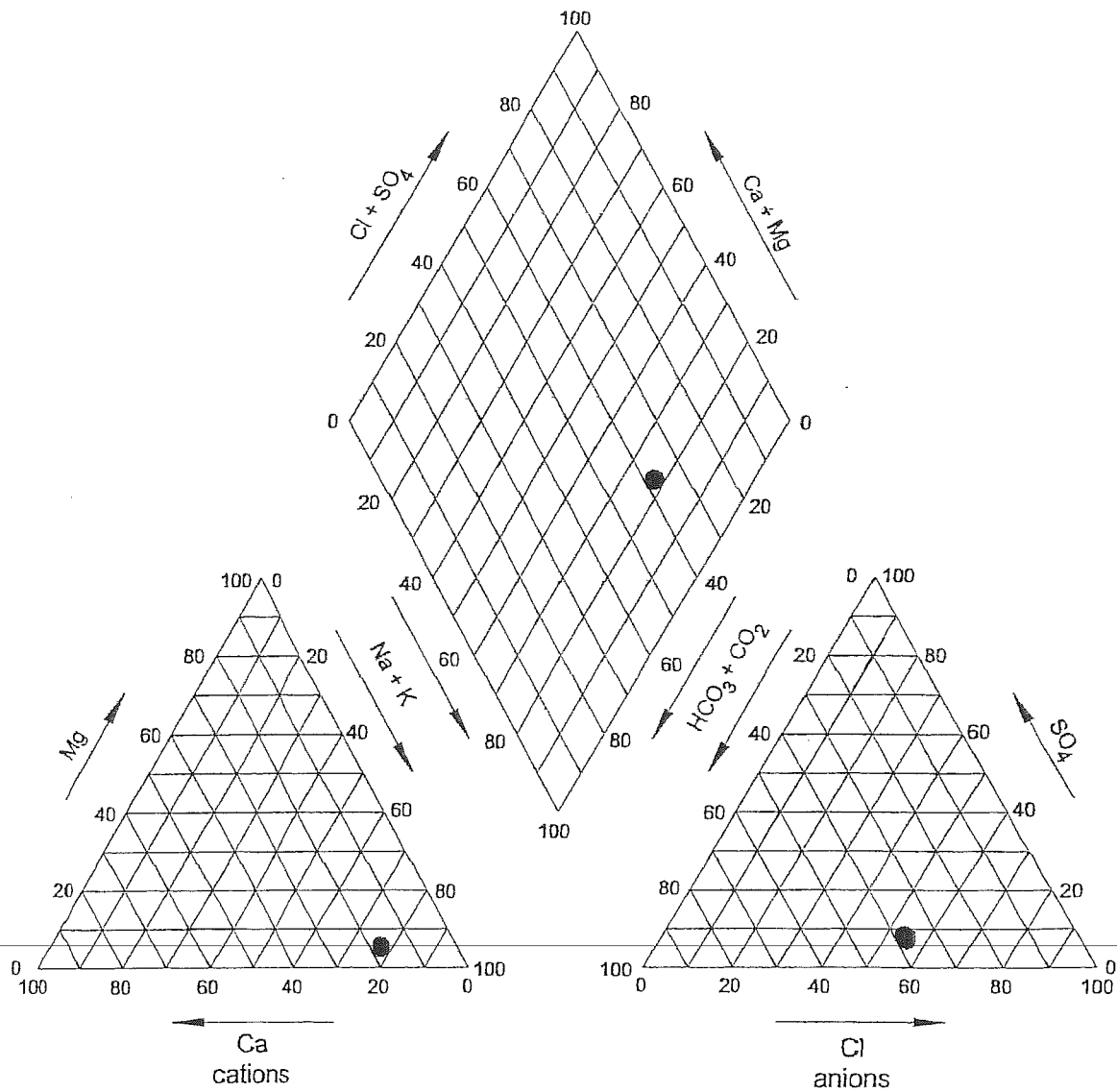


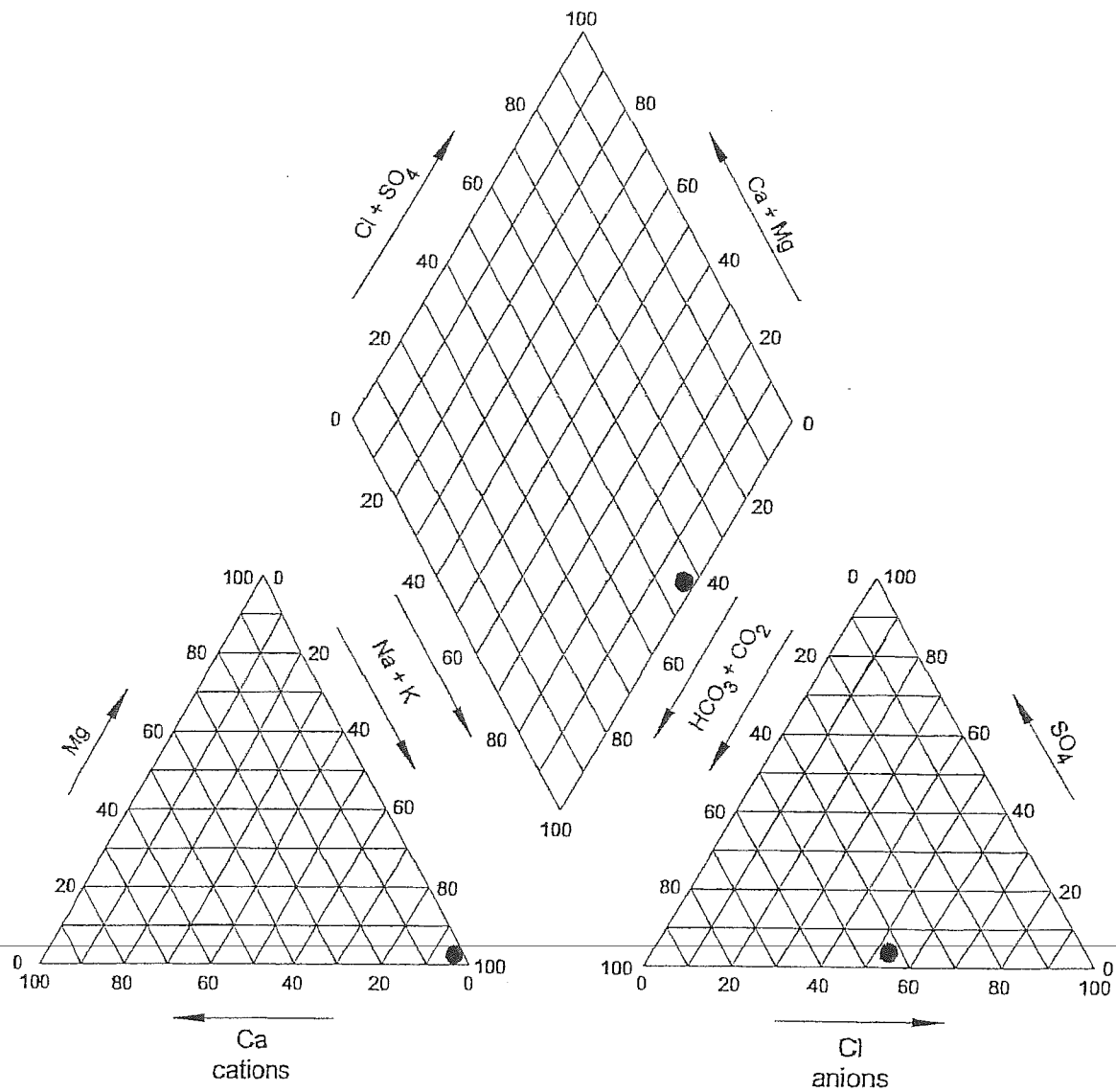


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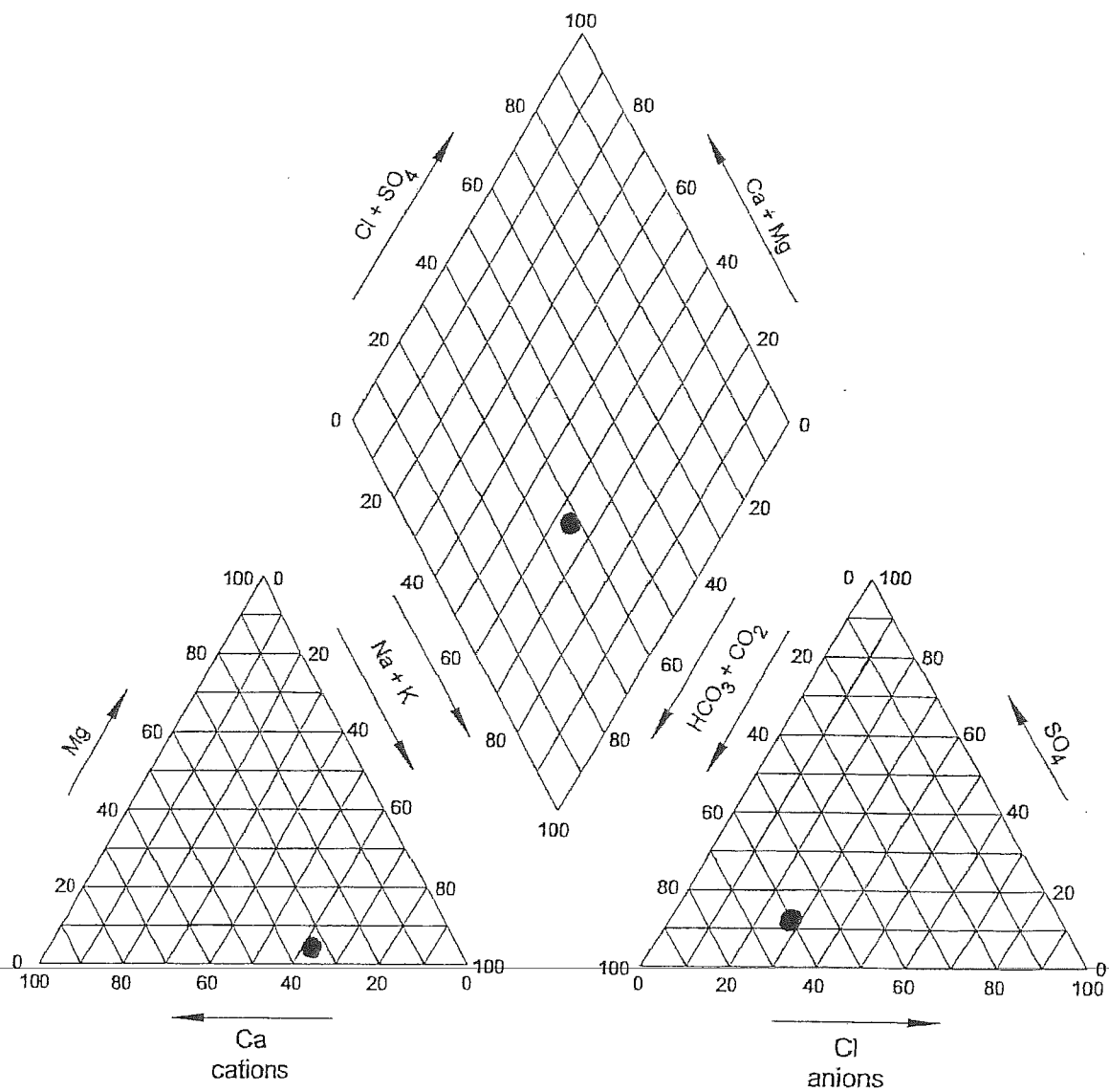


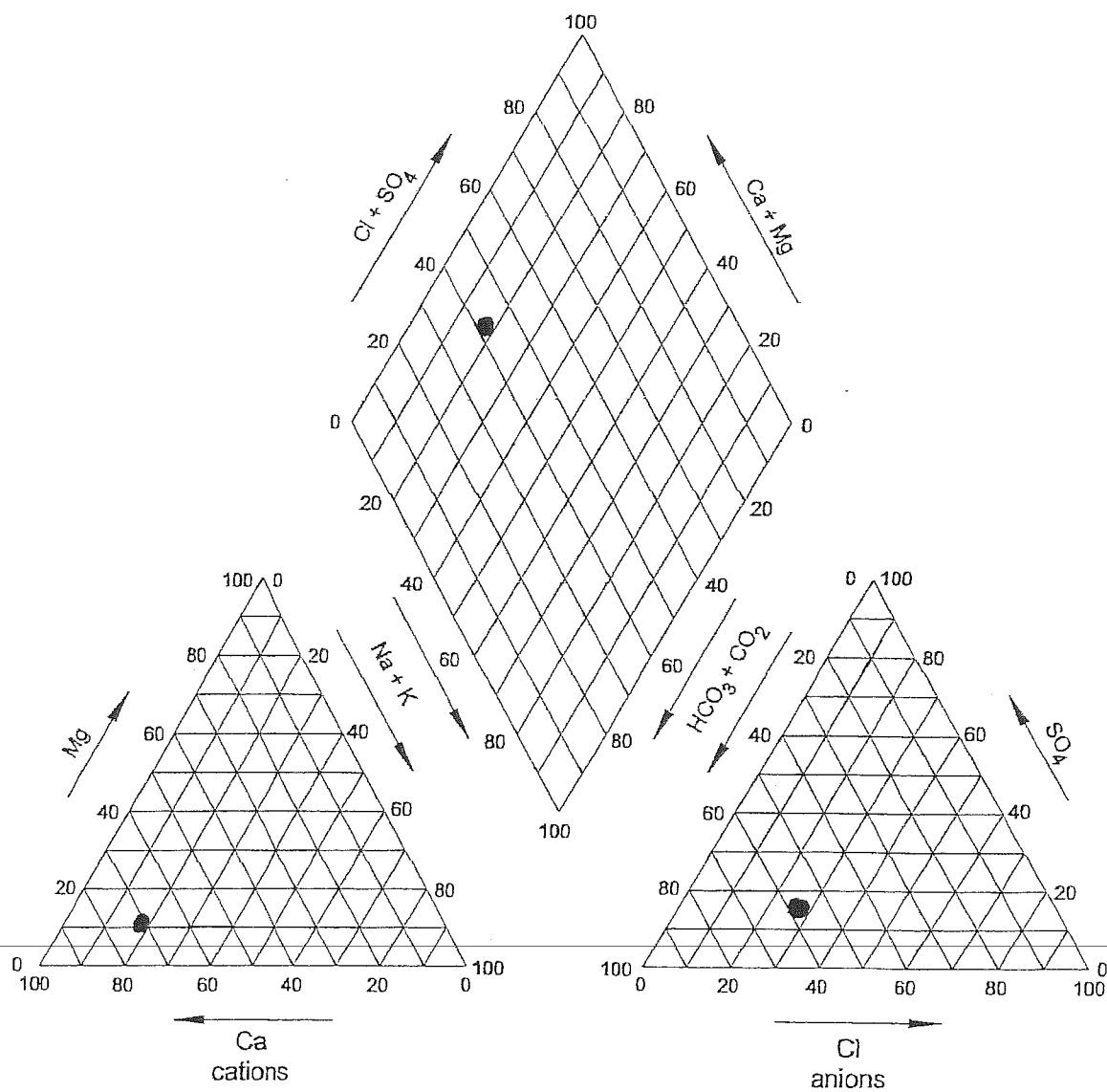
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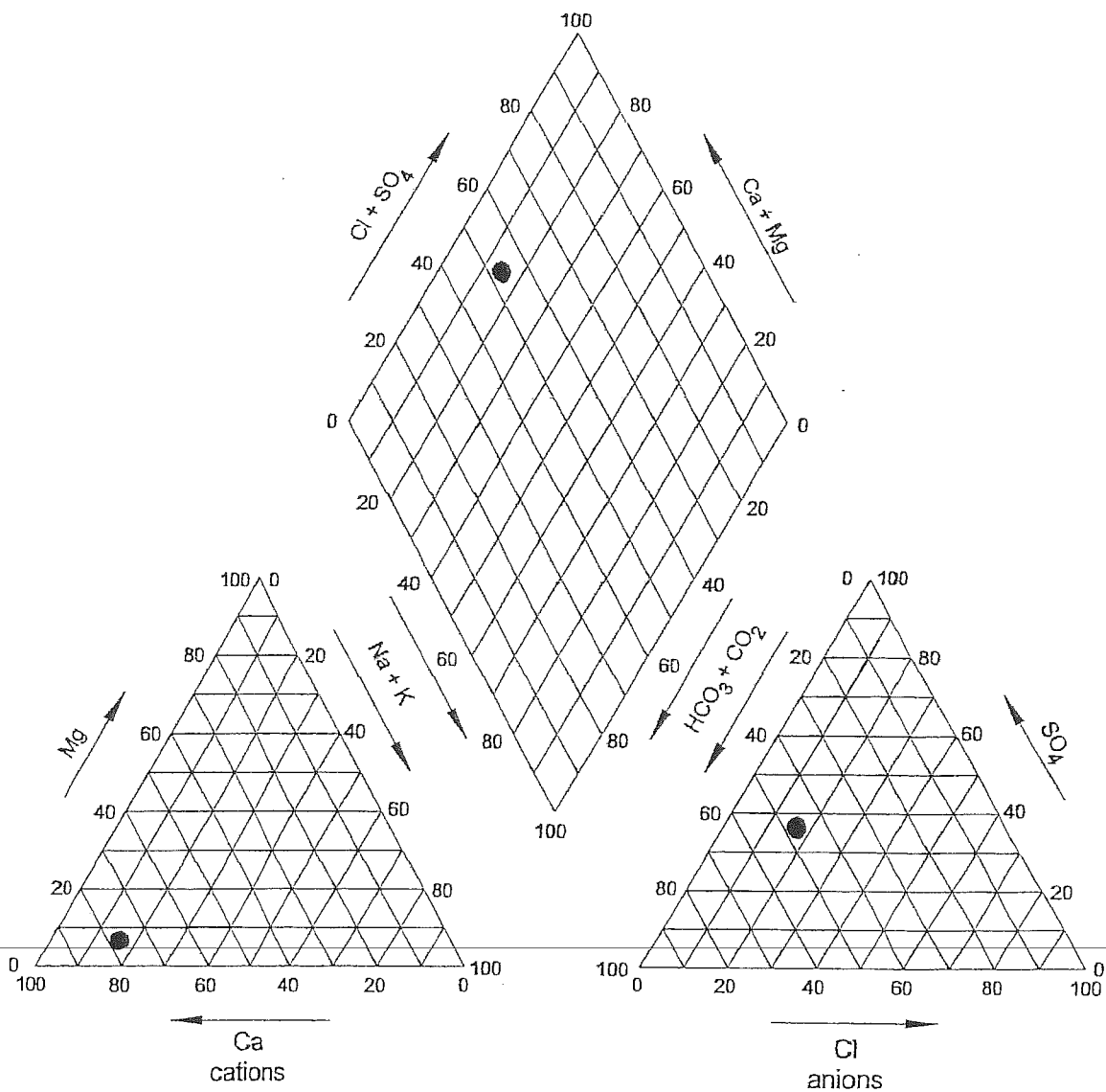


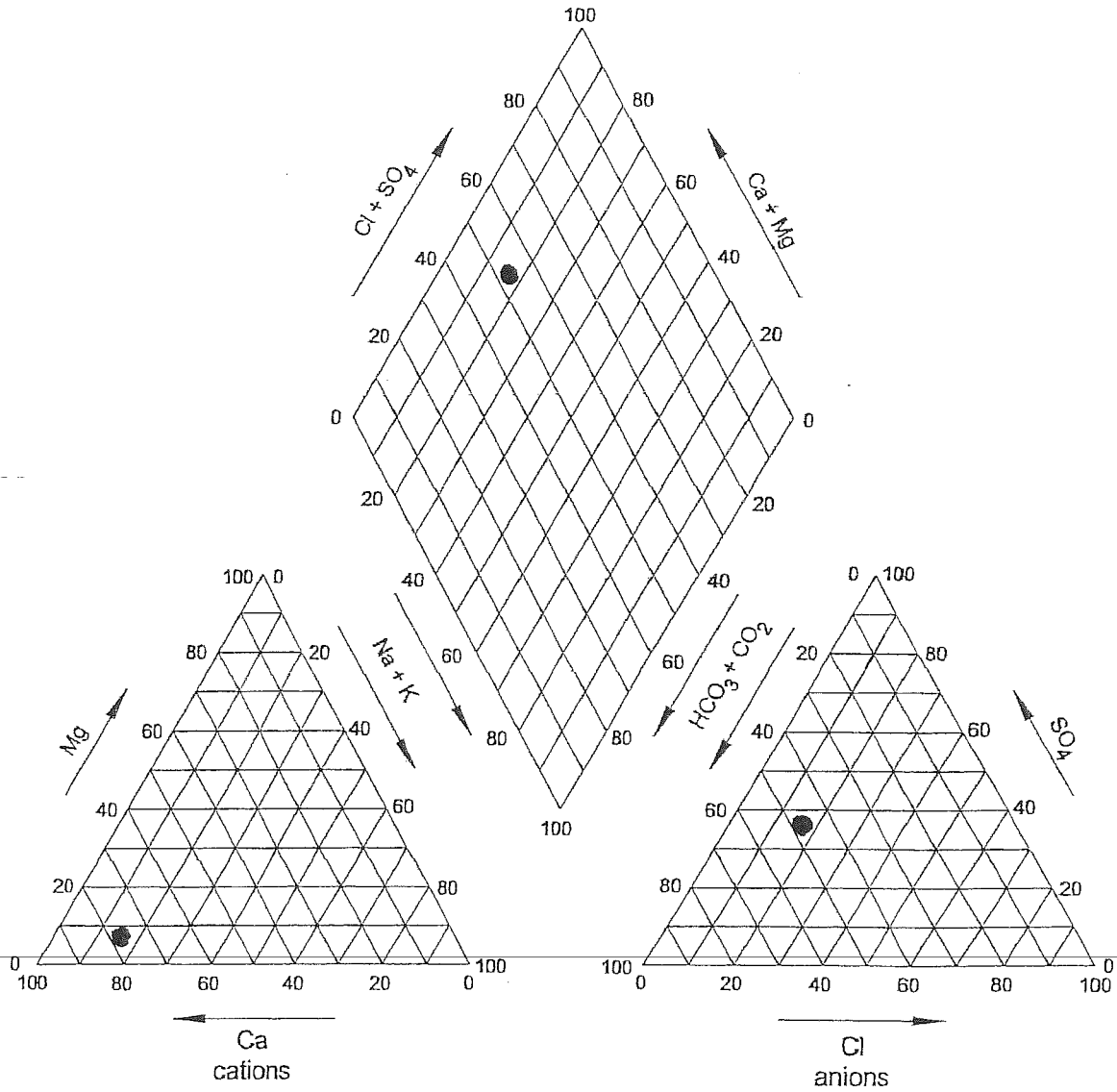
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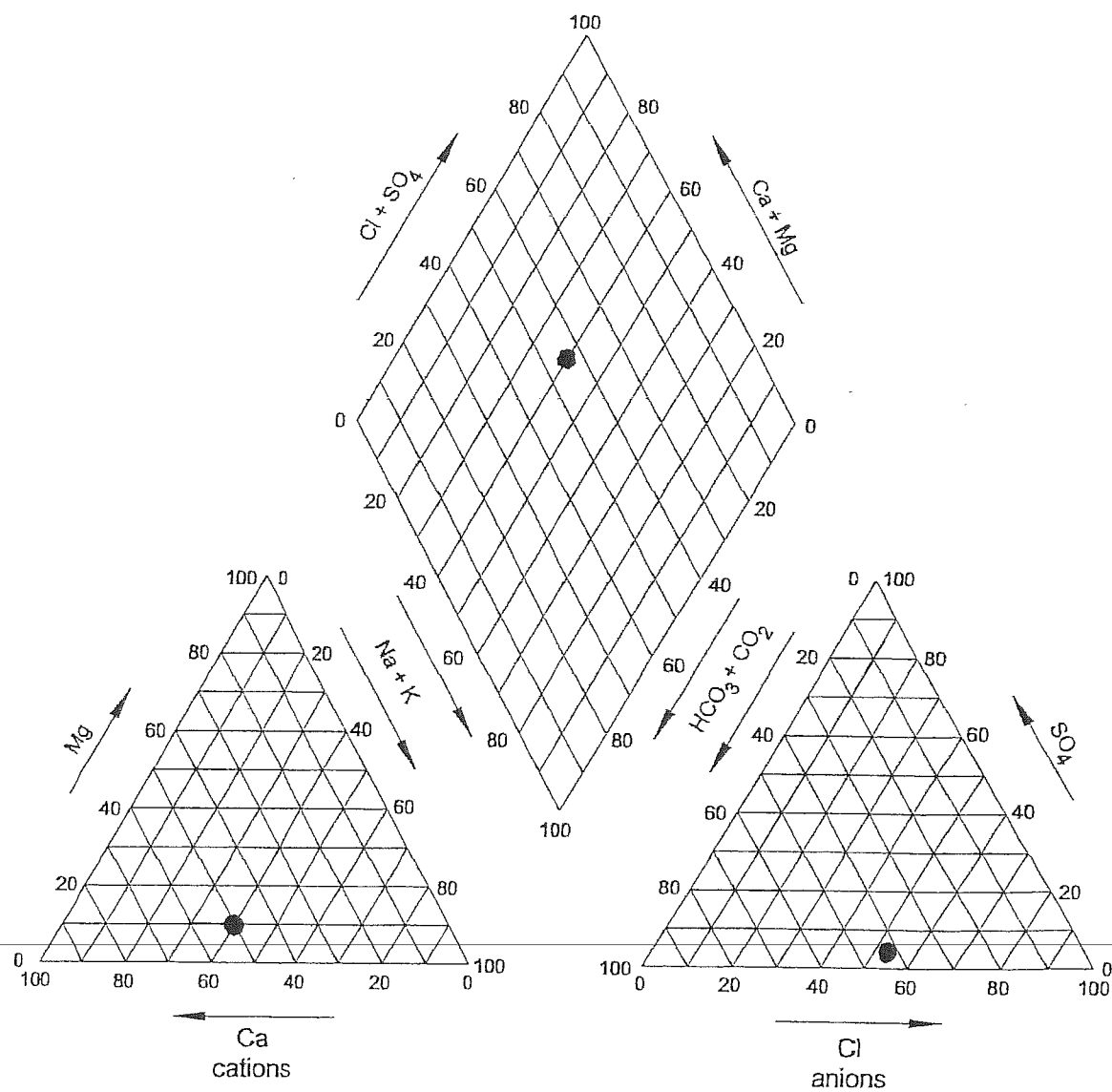


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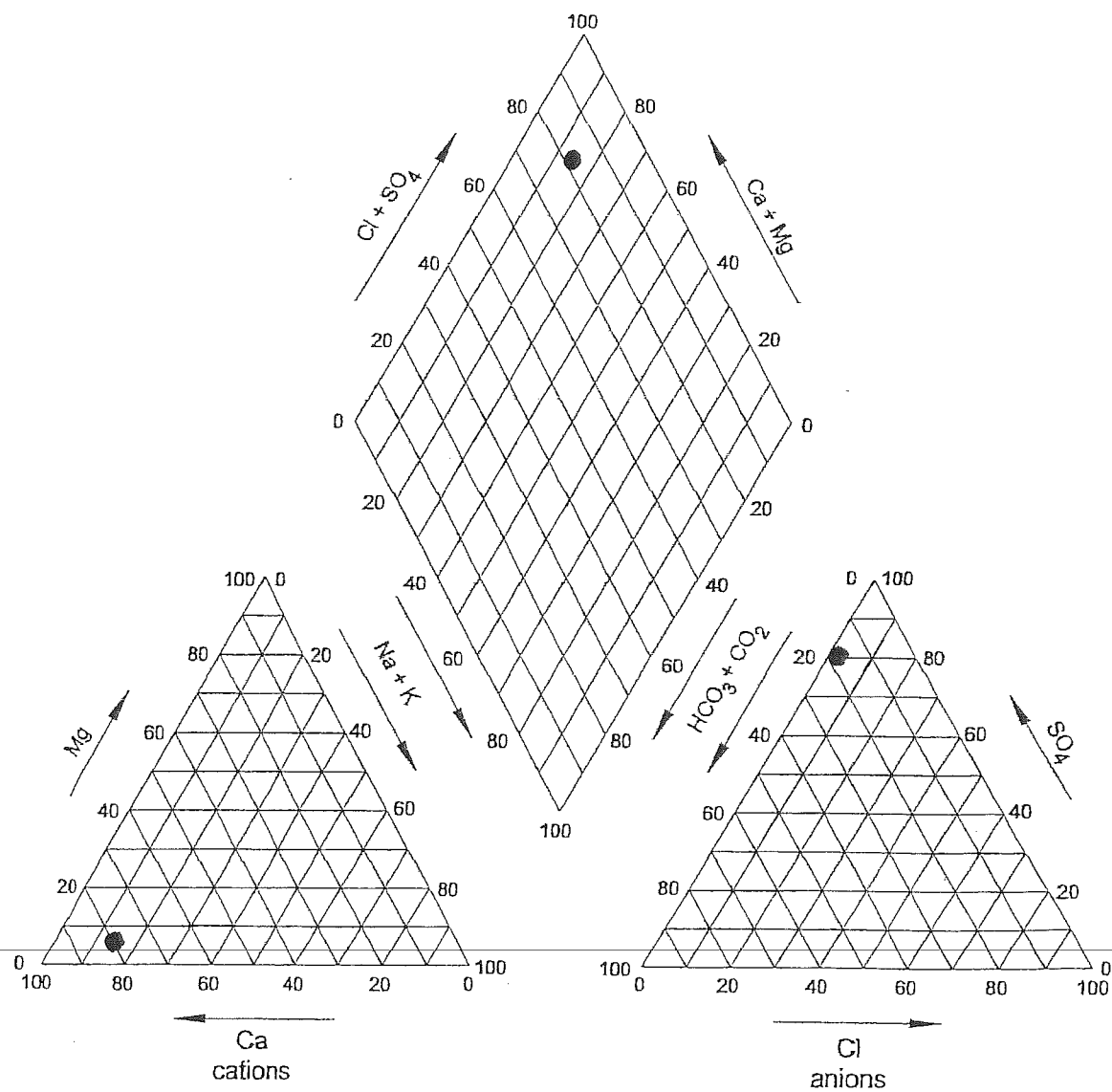


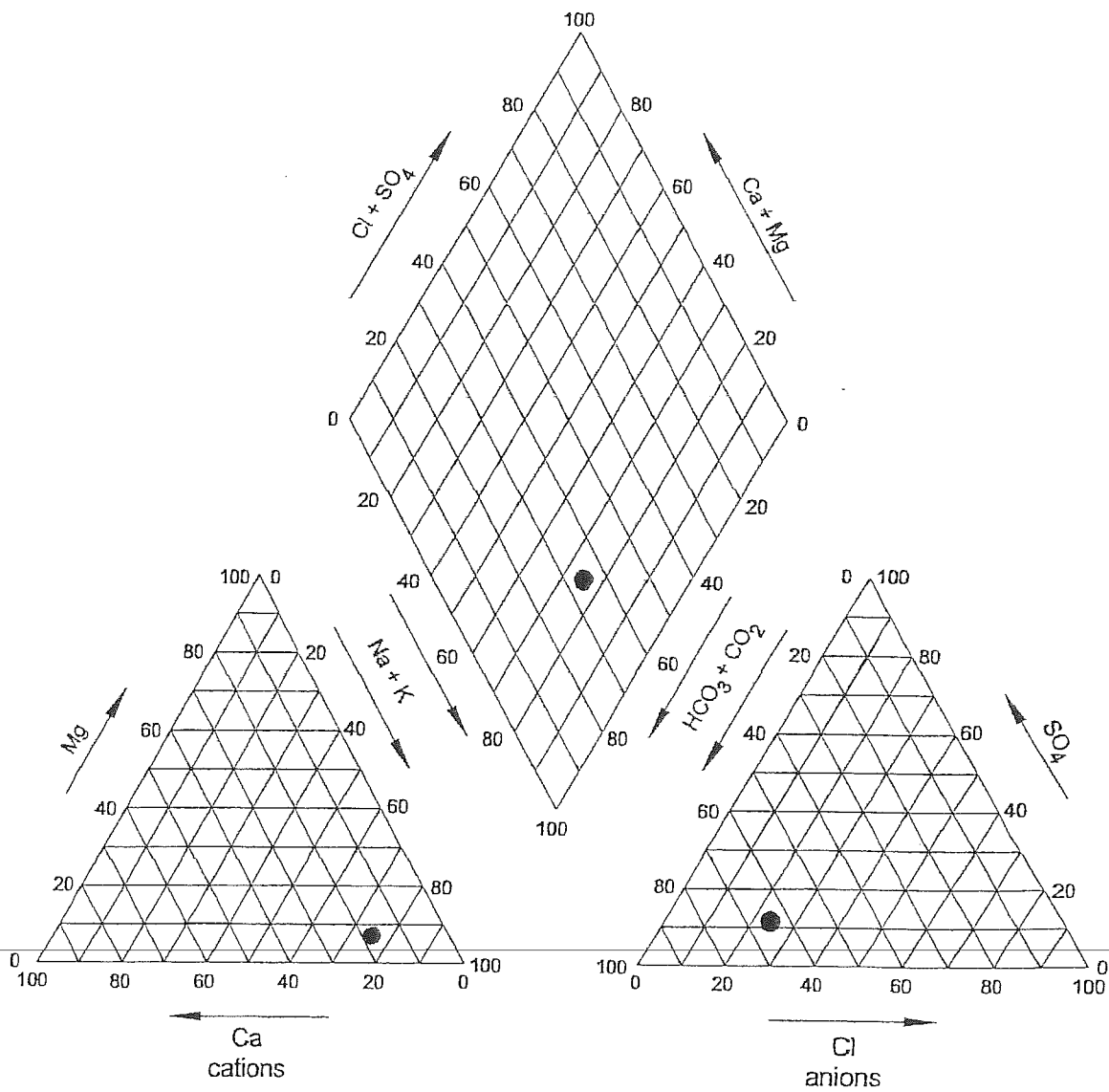
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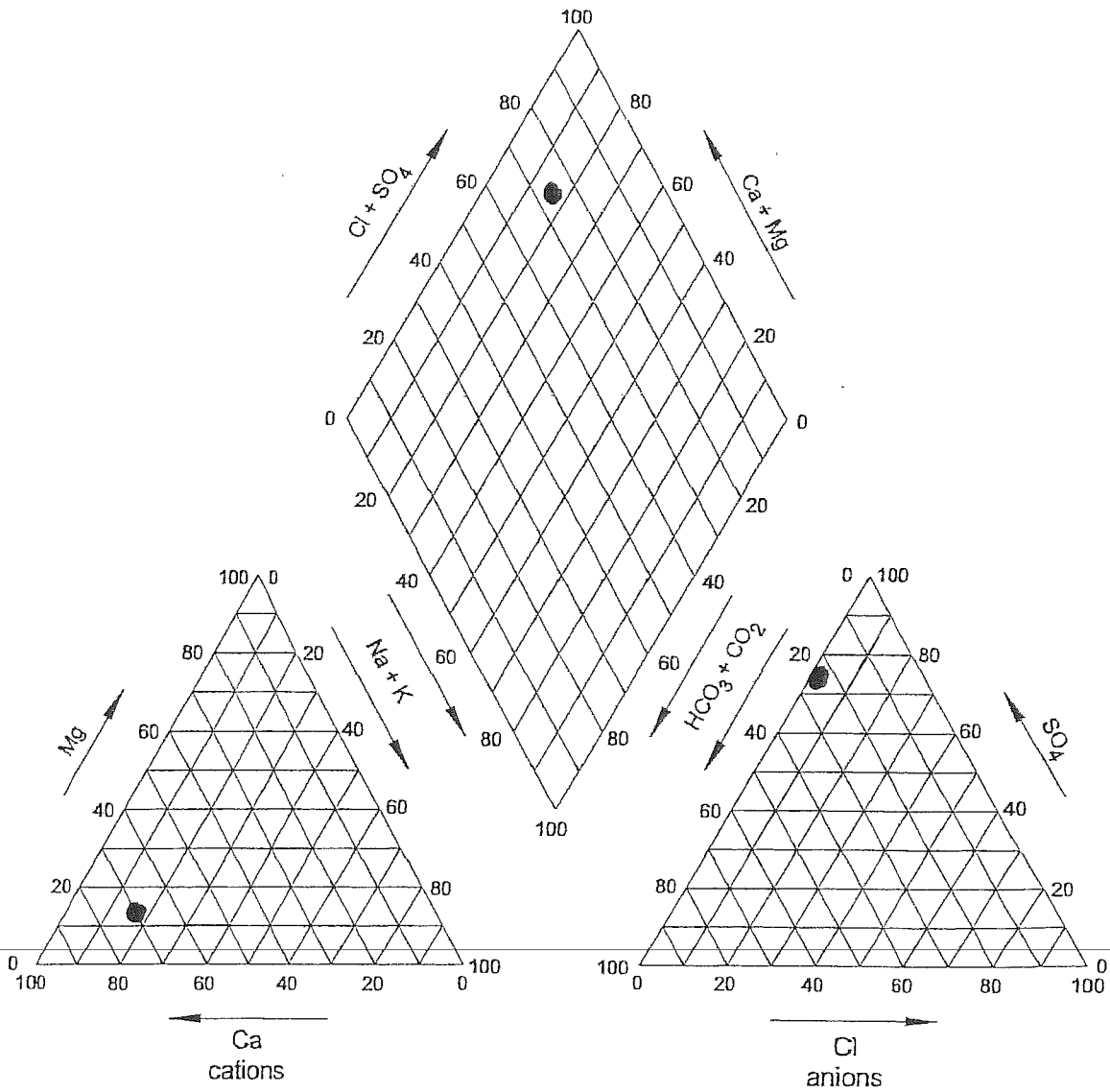


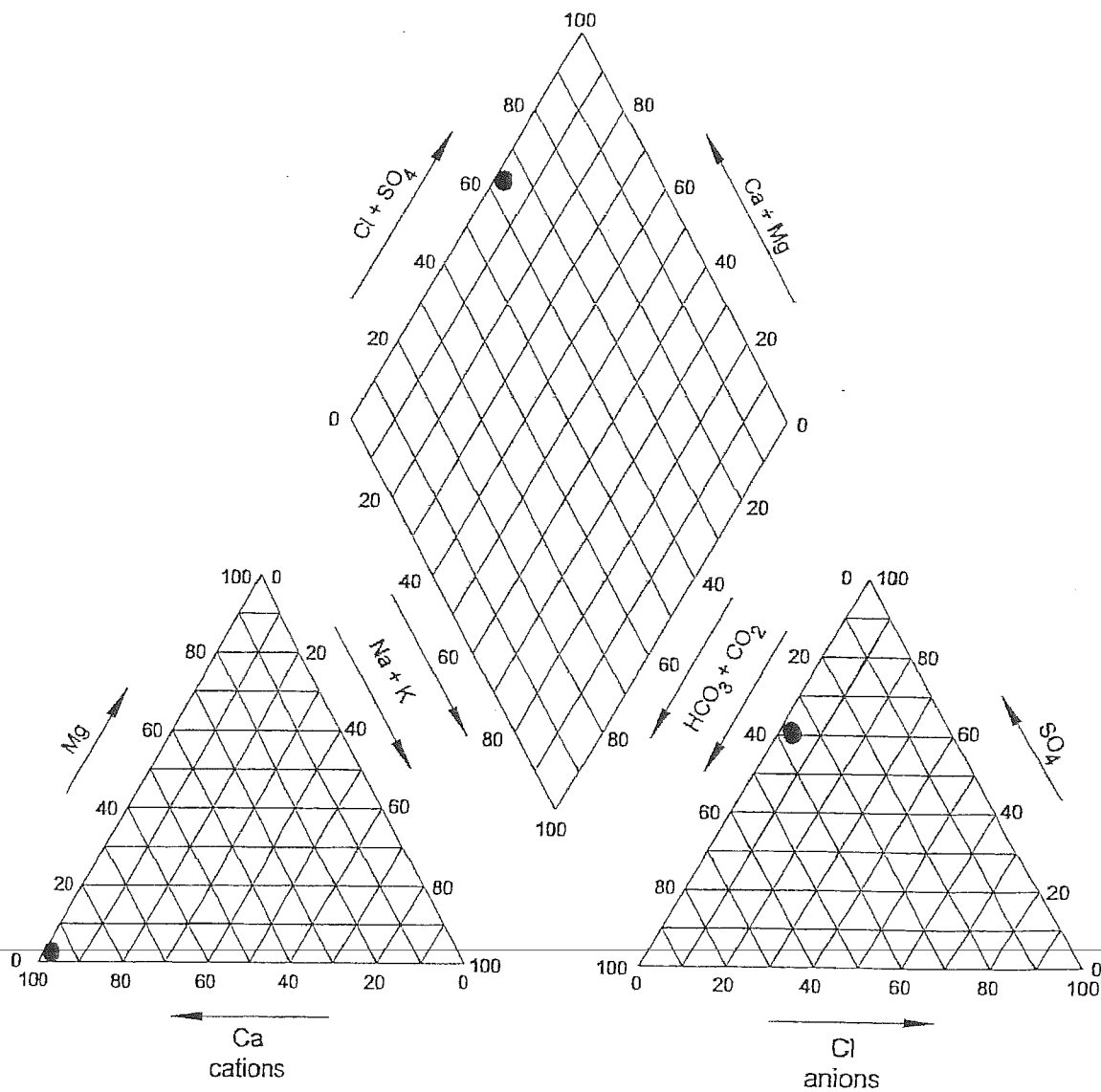


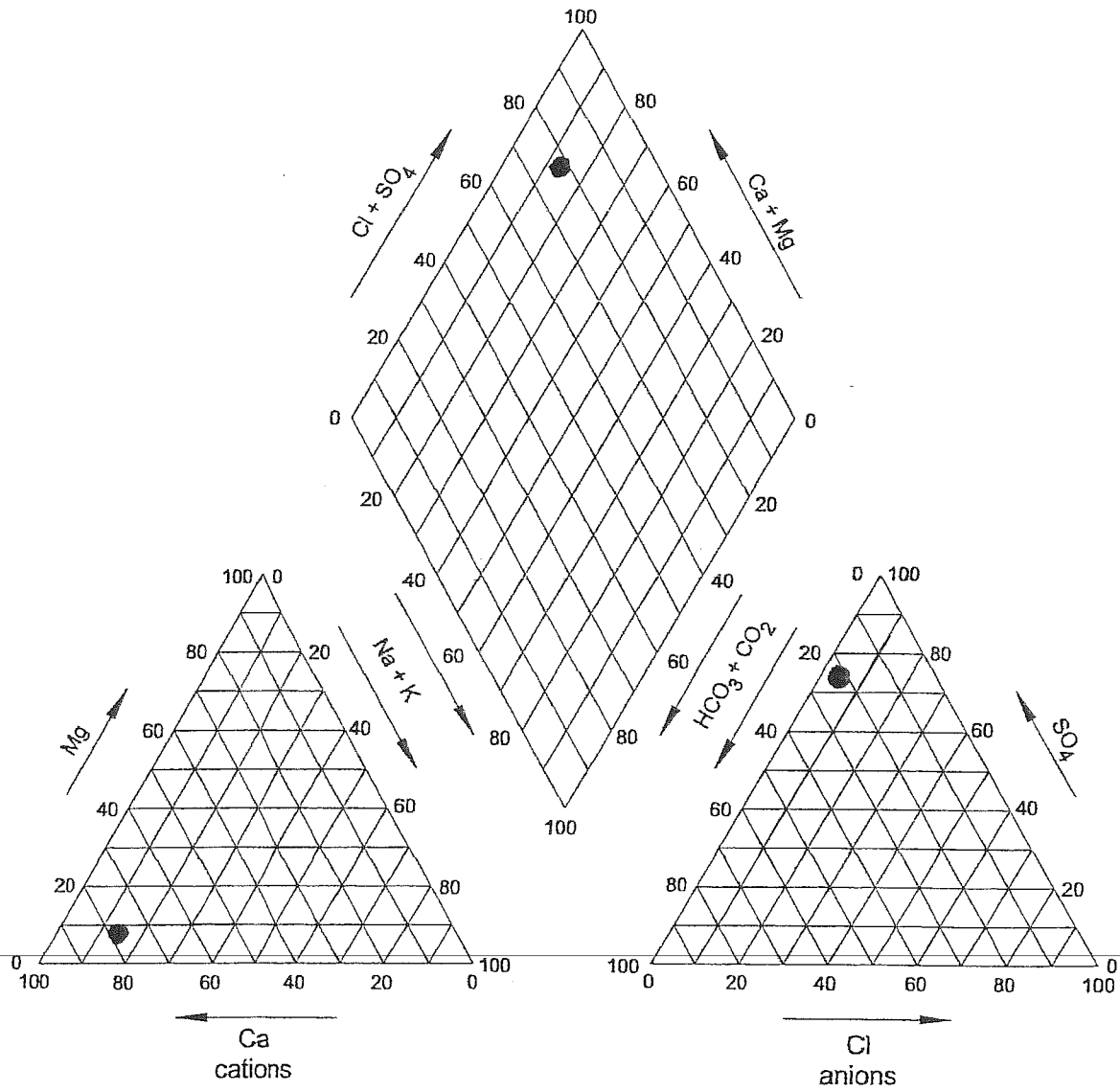
# 58 Juniper Hill Lp











# **Figure 3**

## **Color Map Of**

### **Geology of Sandia Park quadrangle, Bernalillo and Sandoval Counties, New Mexico**

**MAP NOT INCLUDED**

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**Can be obtained from the NM Bureau of Mines &  
Mineral Resources (NMBMMR Open File Map Series  
OF-GM-1) at New Mexico Tech.**

# APPENDIX

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# **WATER TYPE 1**

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# Pinon Ridge Subdivision



## Legend

- Located Wells
- Parcel Boundaries

## Water Type



- 46 Mulberry Lp
- 37 Mulberry Lp
- 66 Juniper Hill Lp
- 15 Aspen Lp

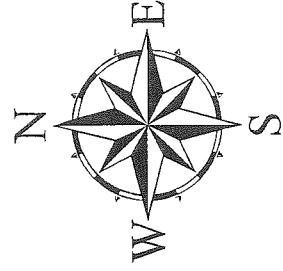
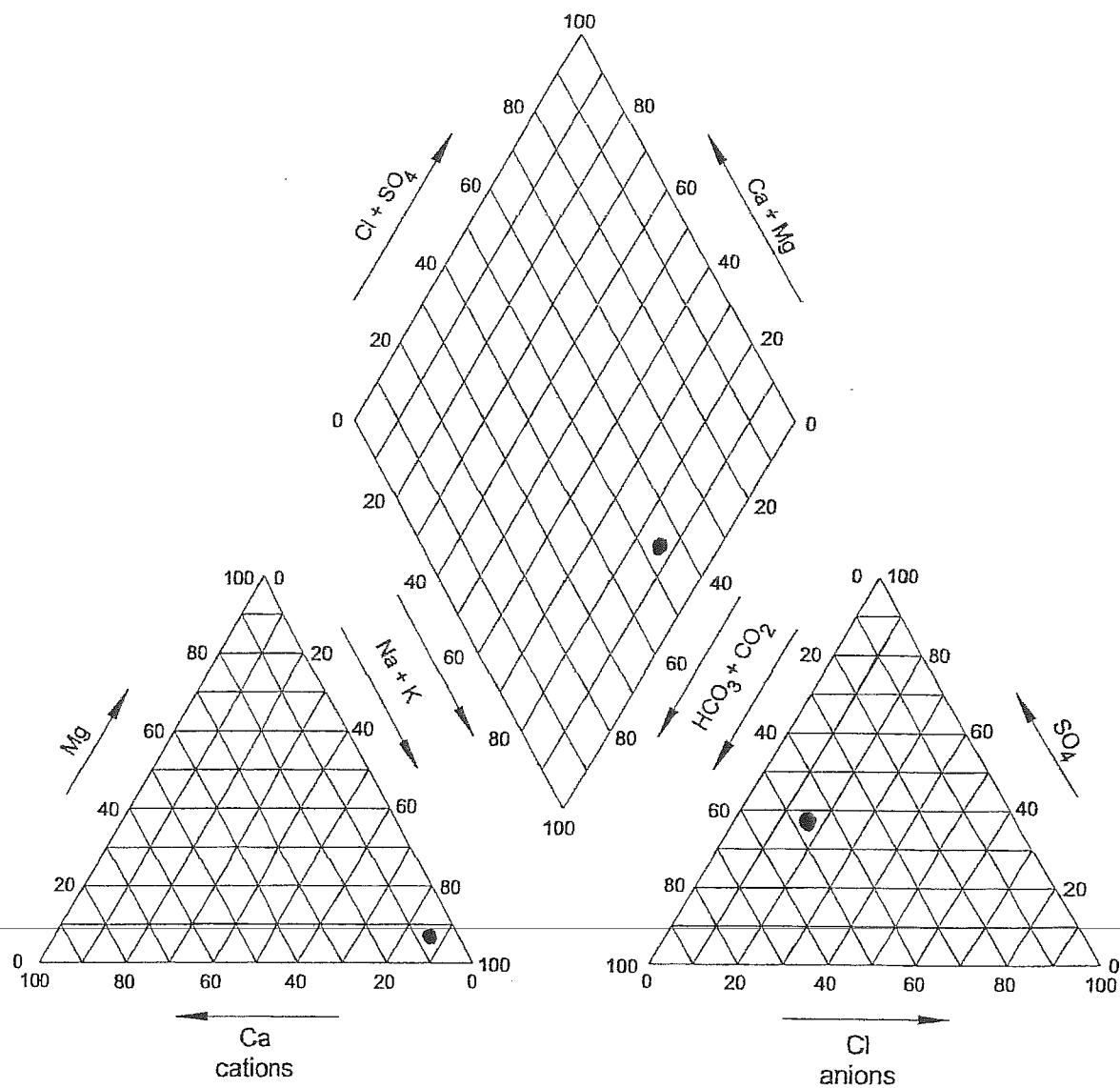
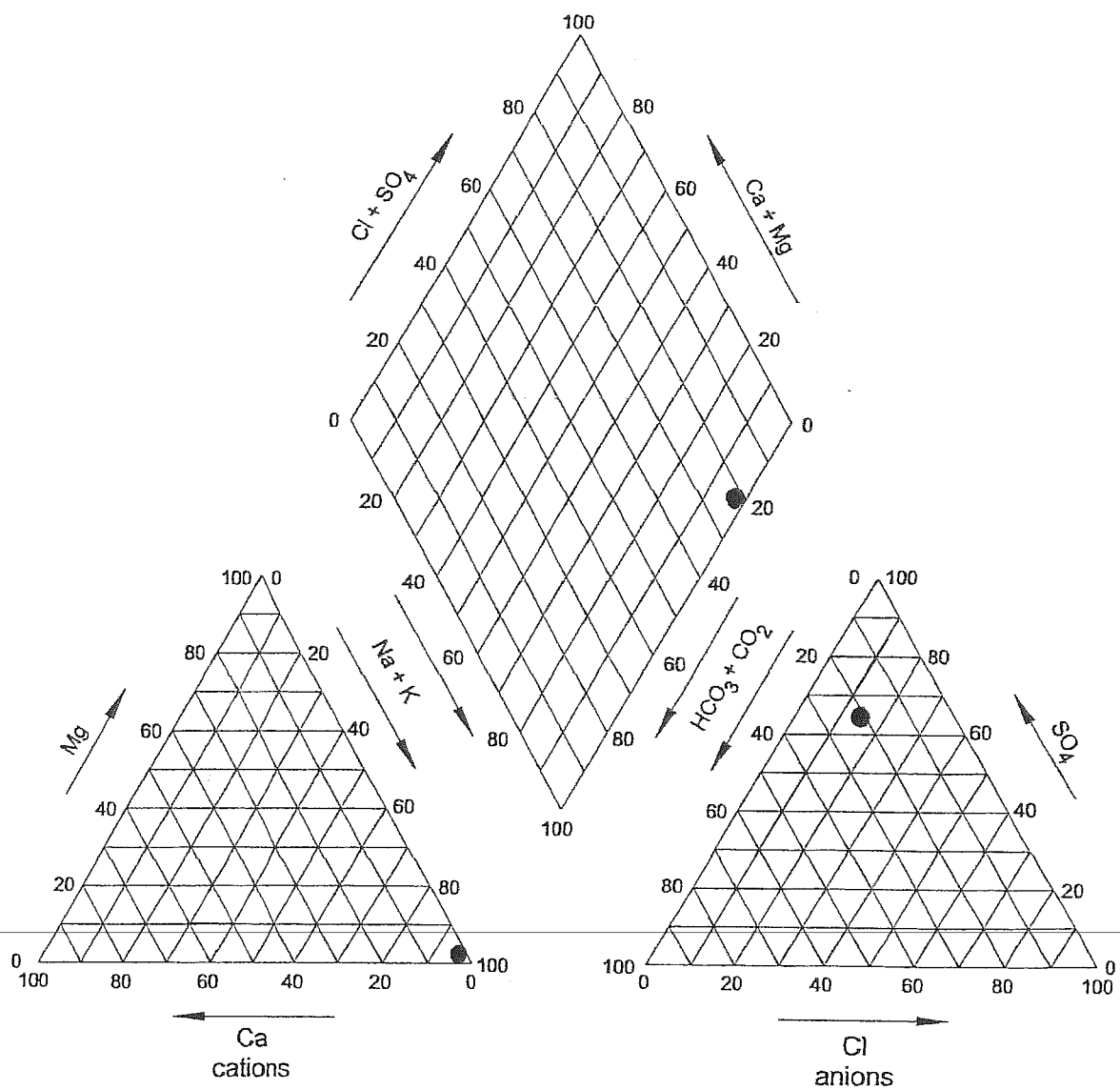


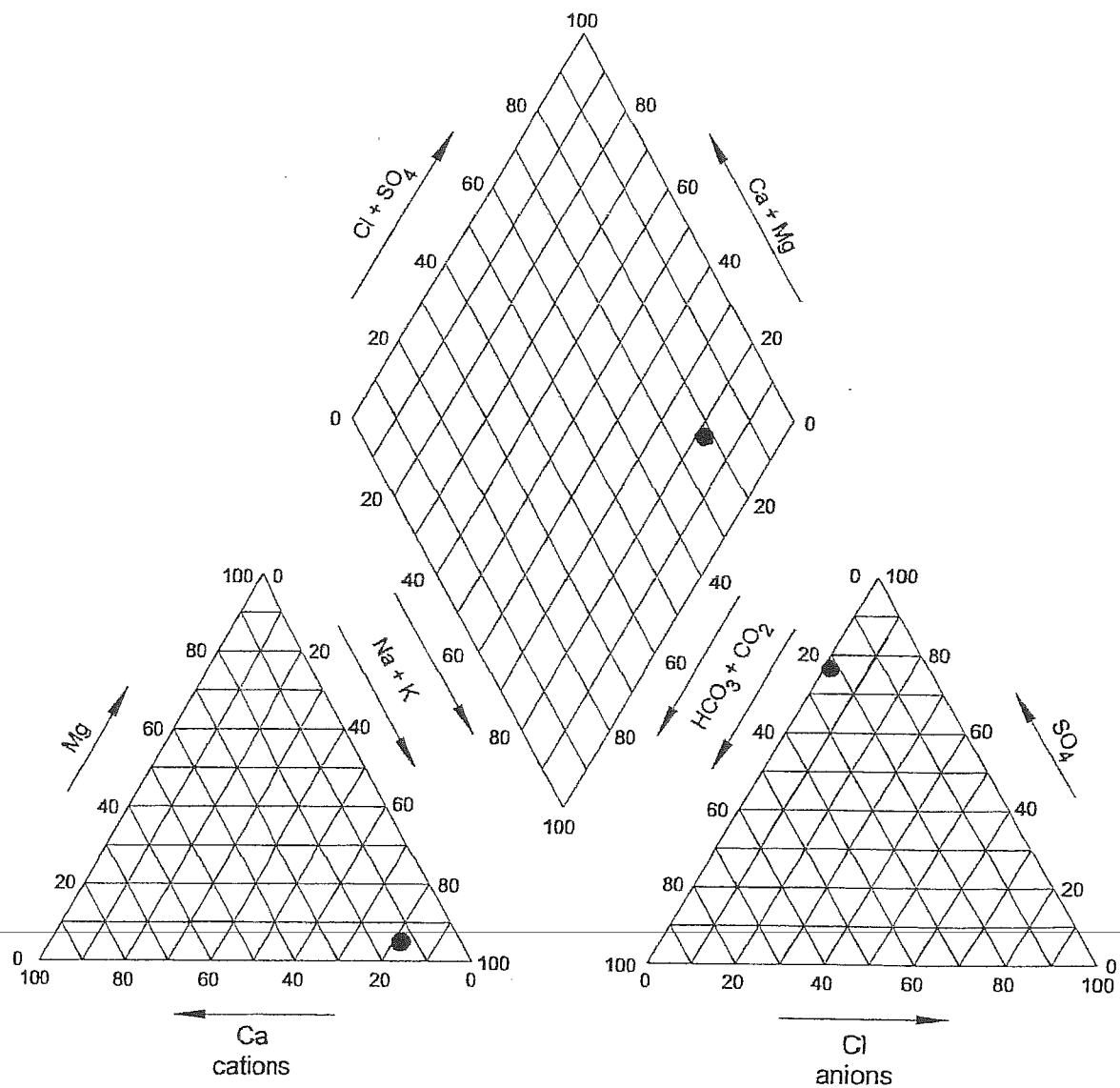
FIGURE 4

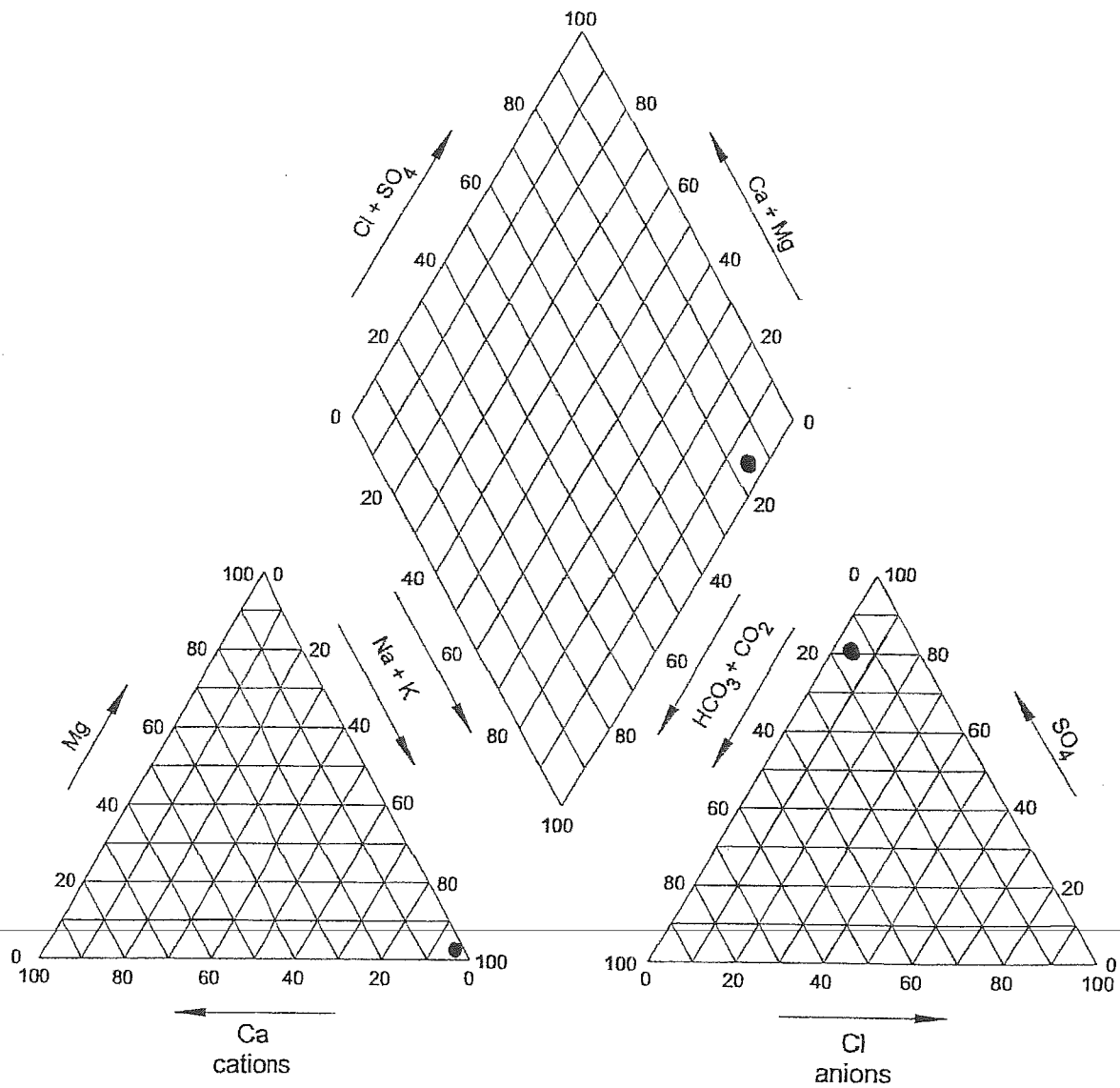


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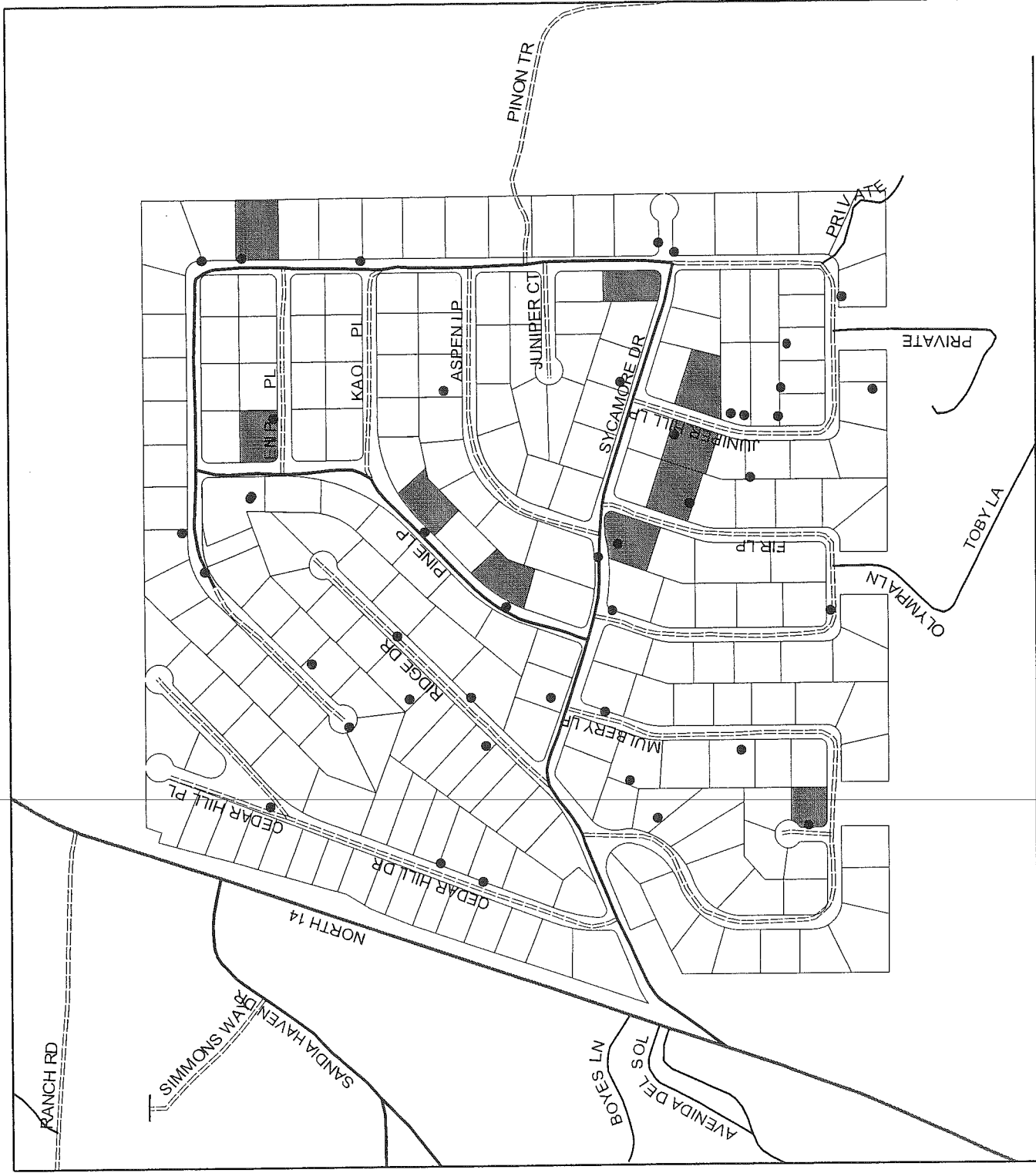


# 66 Juniper Hill Lp





# Pinon Ridge Subdivision



## Legend

- Located Wells
- Parcel Boundaries

## Water Type



- 14 Pine Lp
- 37 Juniper Hill Lp
- 5 Juniper Hill Pl
- 2 Mulberry Ct
- 64 Juniper Hill Lp
- 35 Fir Lp
- 20 Sycamore Dr
- 6 Pine Lp
- 5 Pine Pl
- 4 Juniper Hill Lp

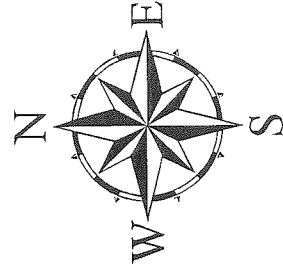


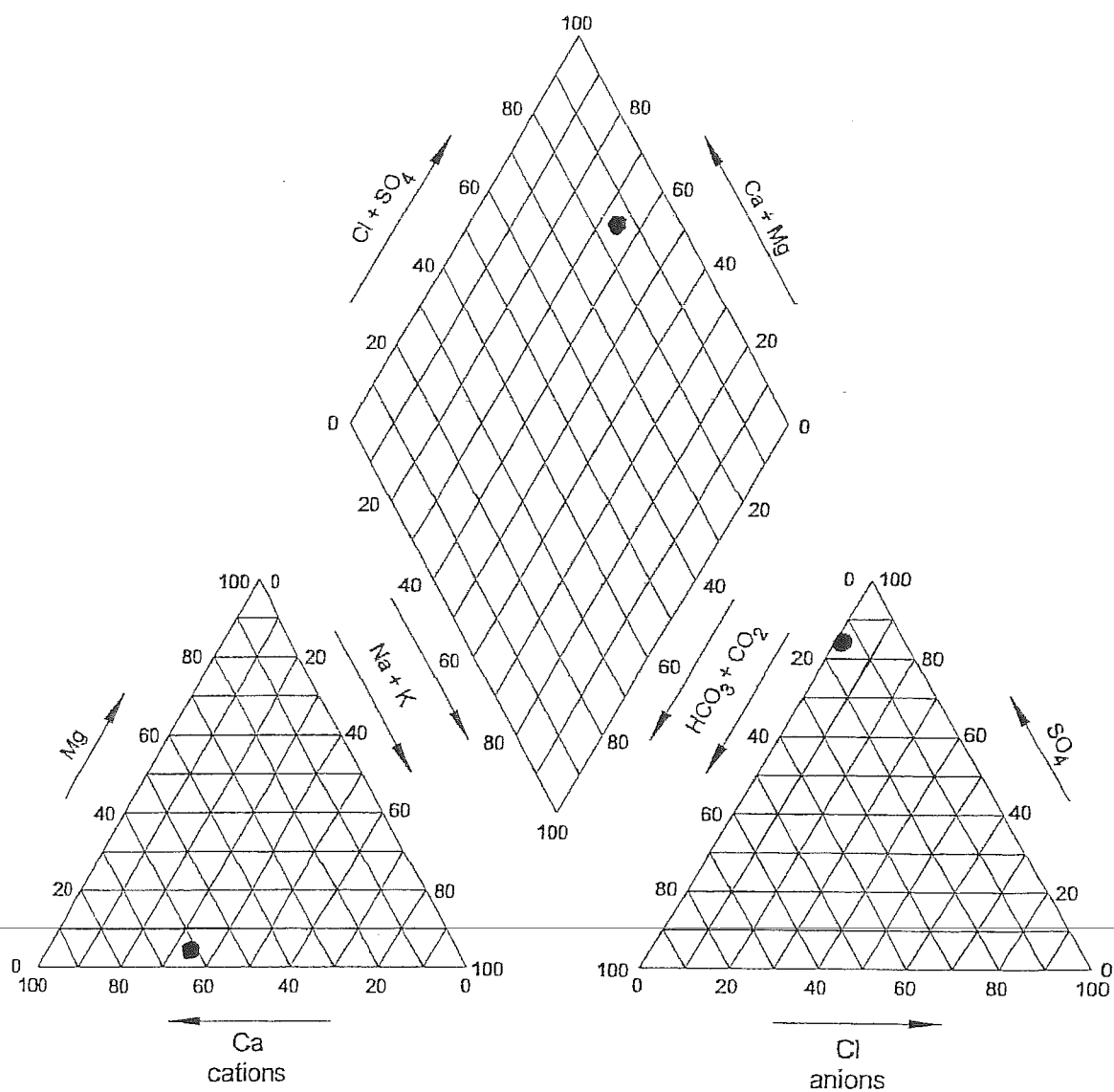
FIGURE 5



## **WATER TYPE 2**

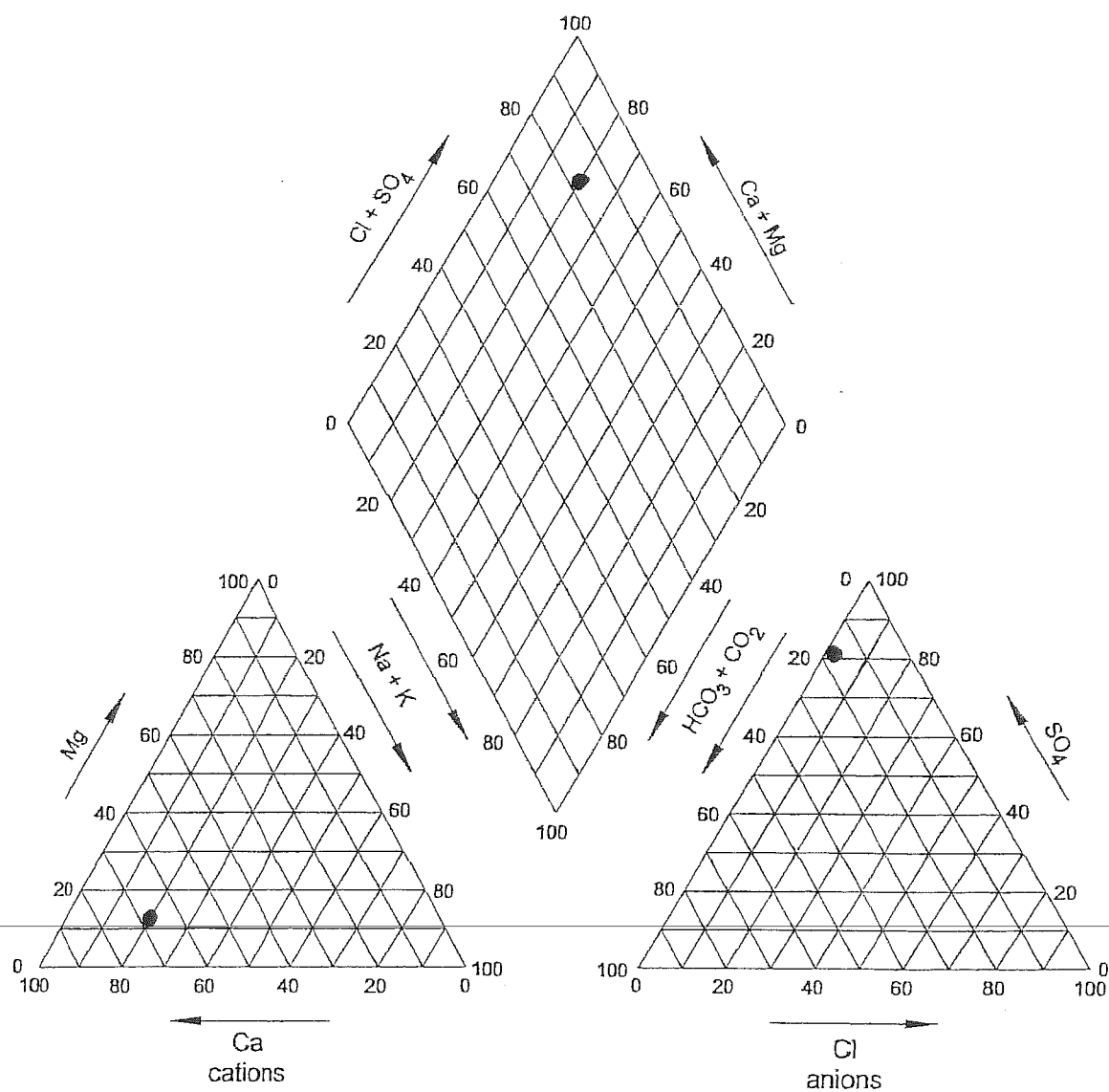
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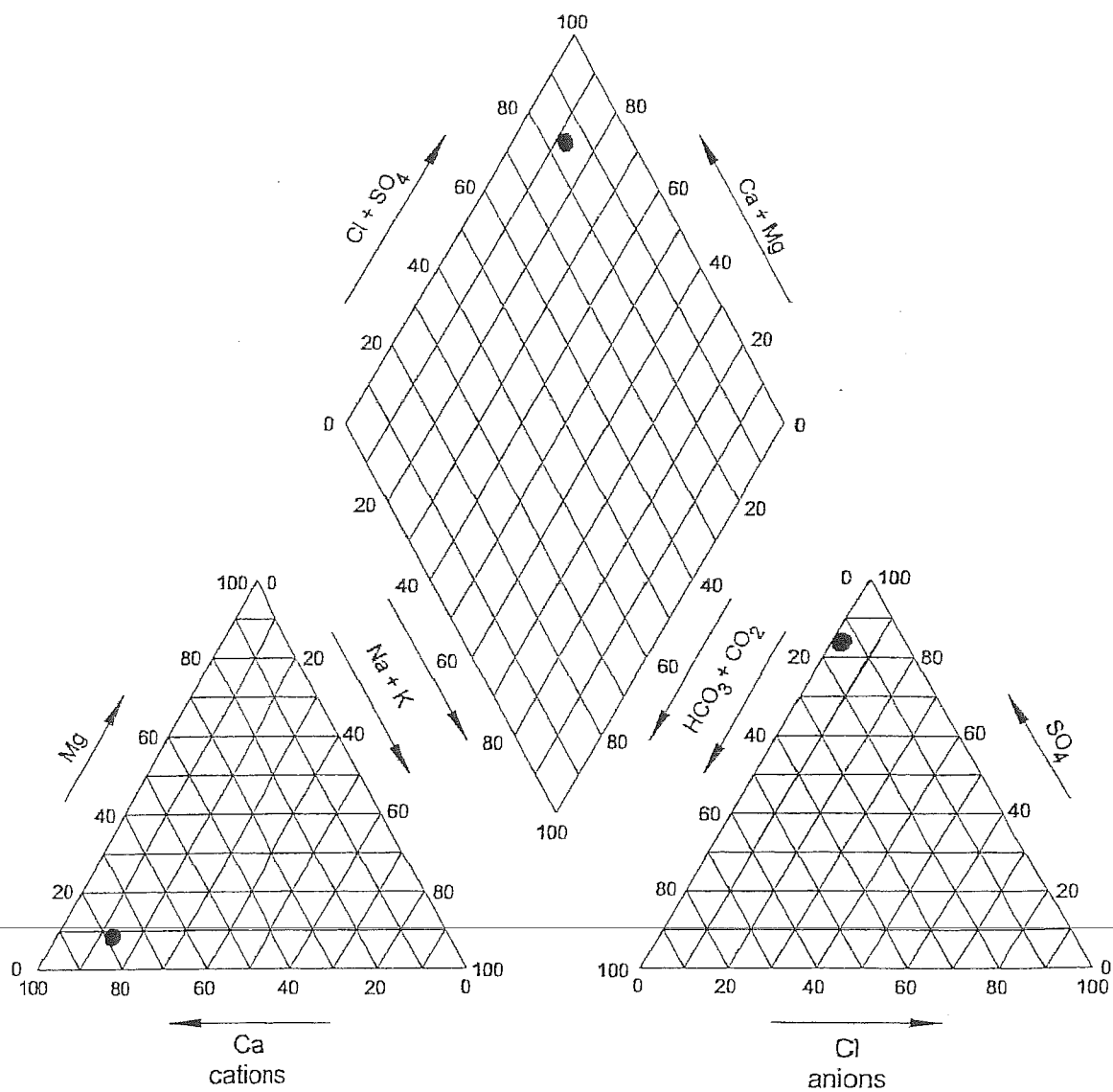
# 14 Pine Lp

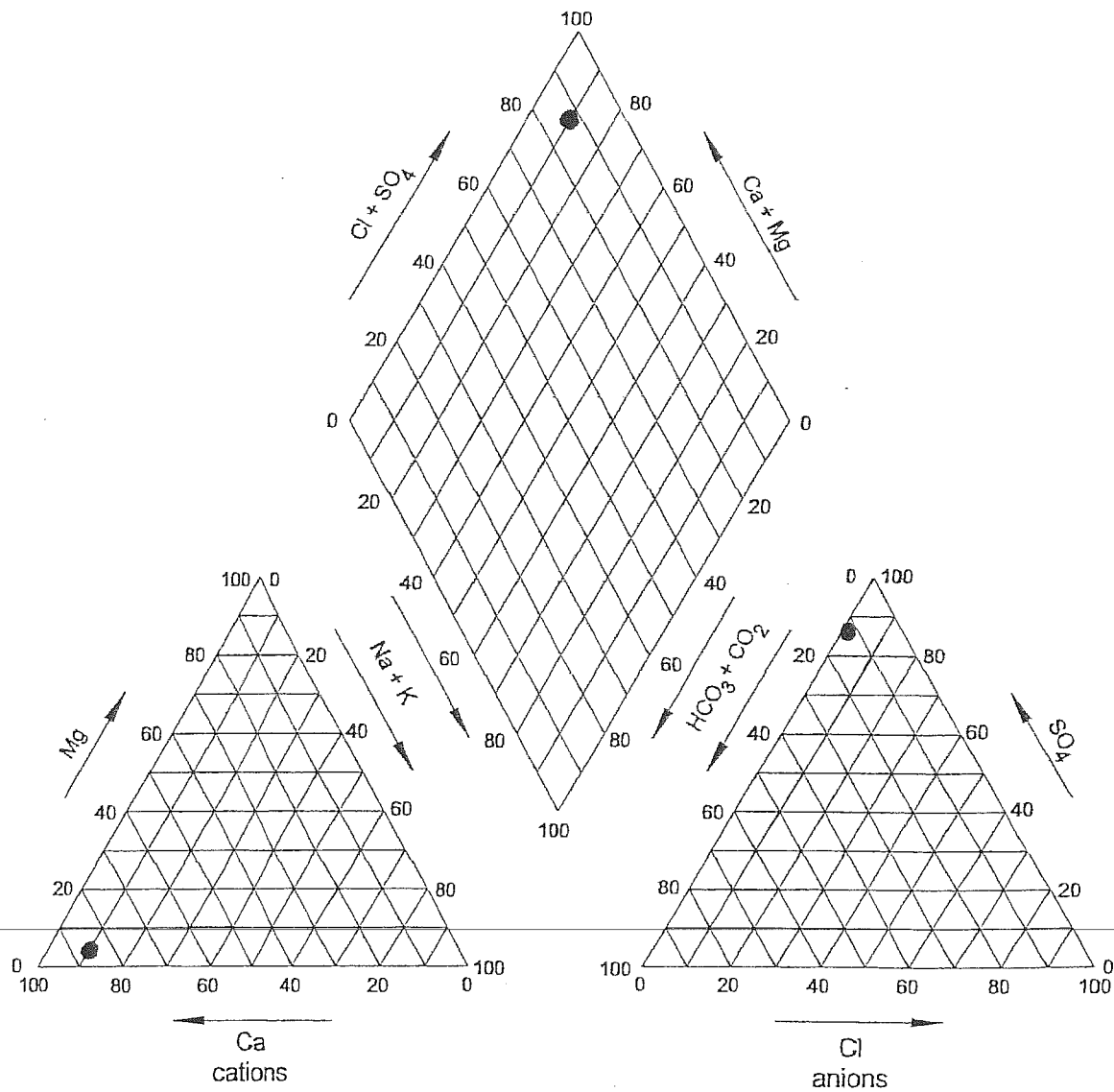




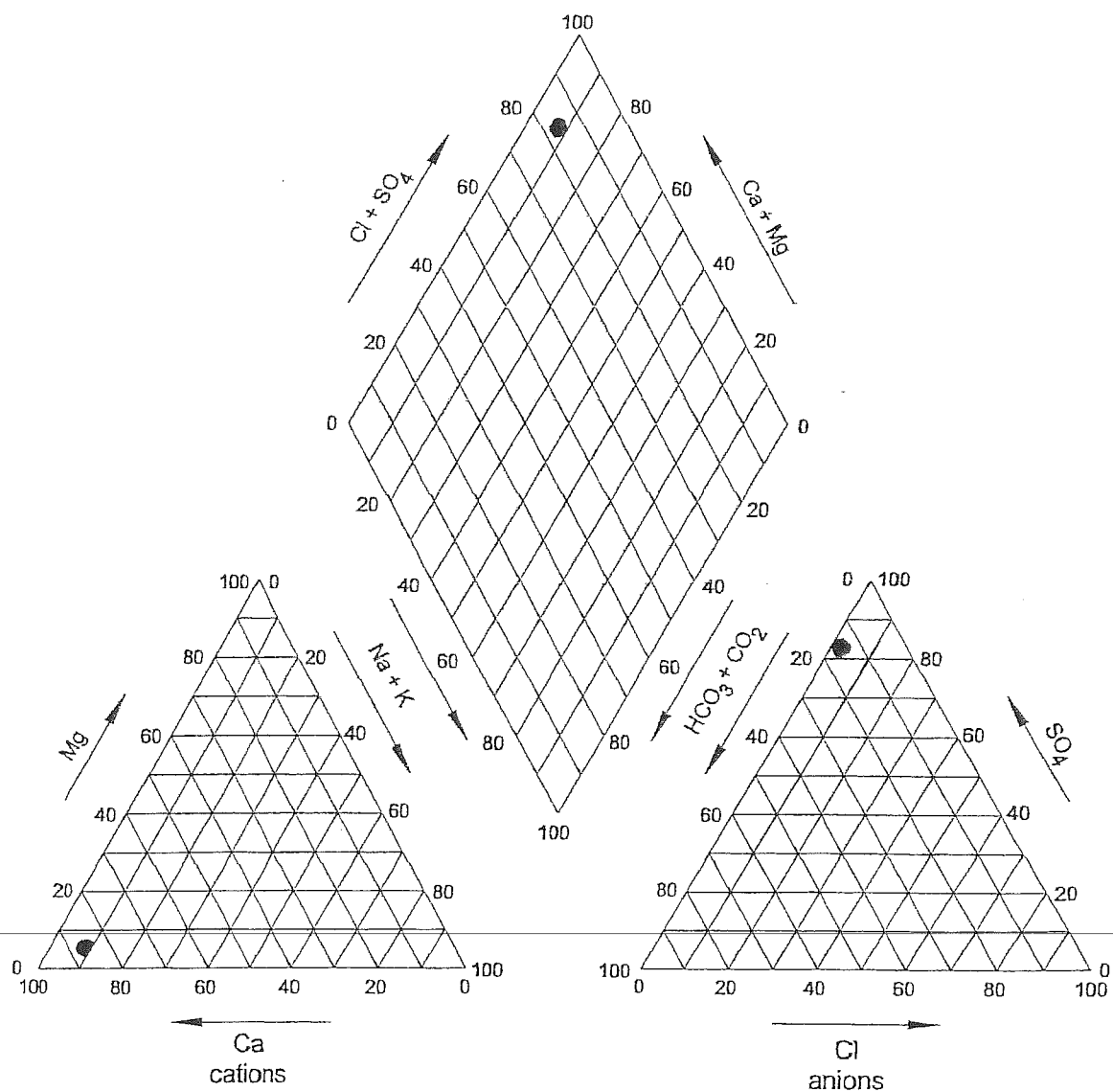
# 37 Juniper Hill Lp



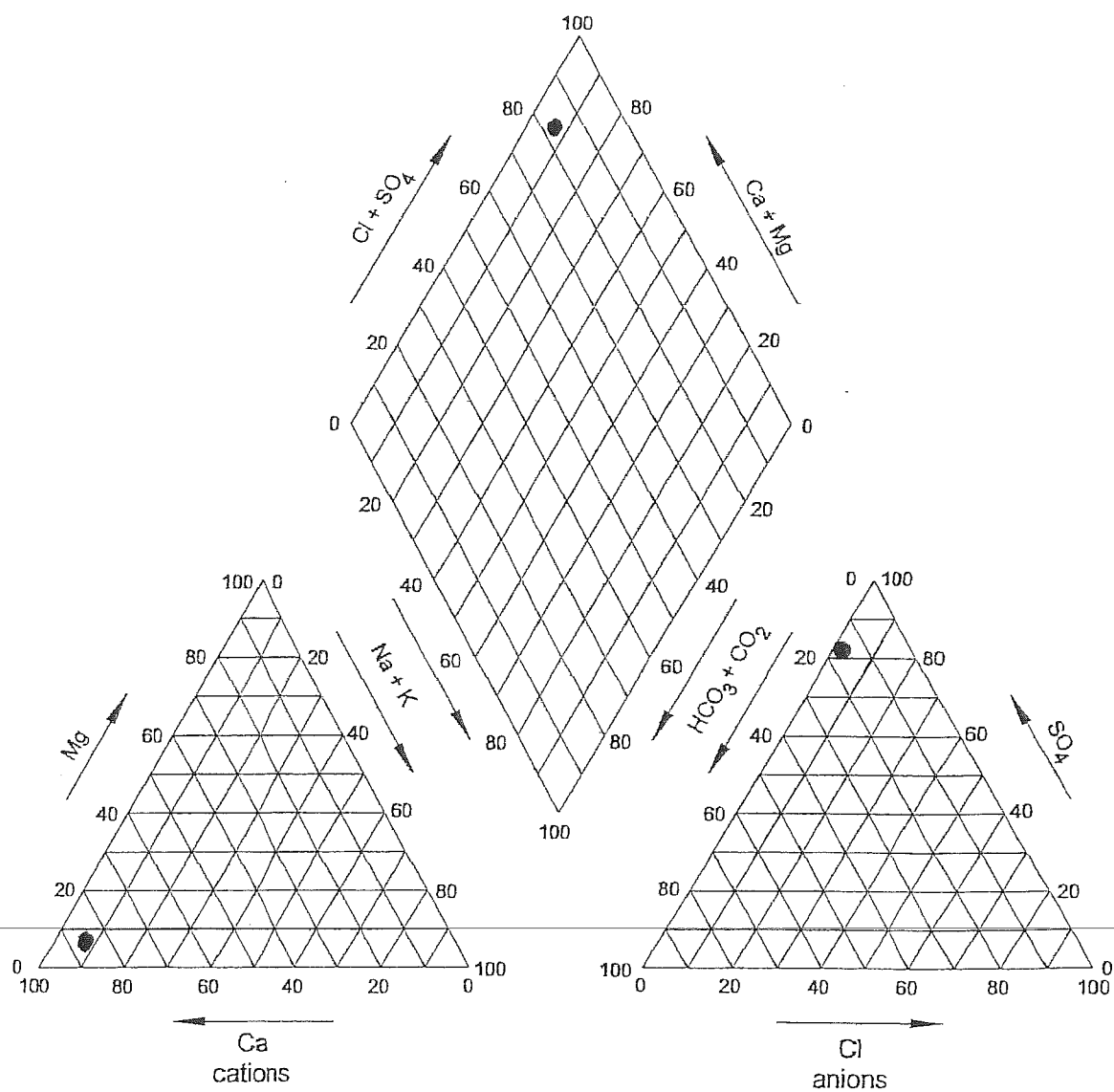




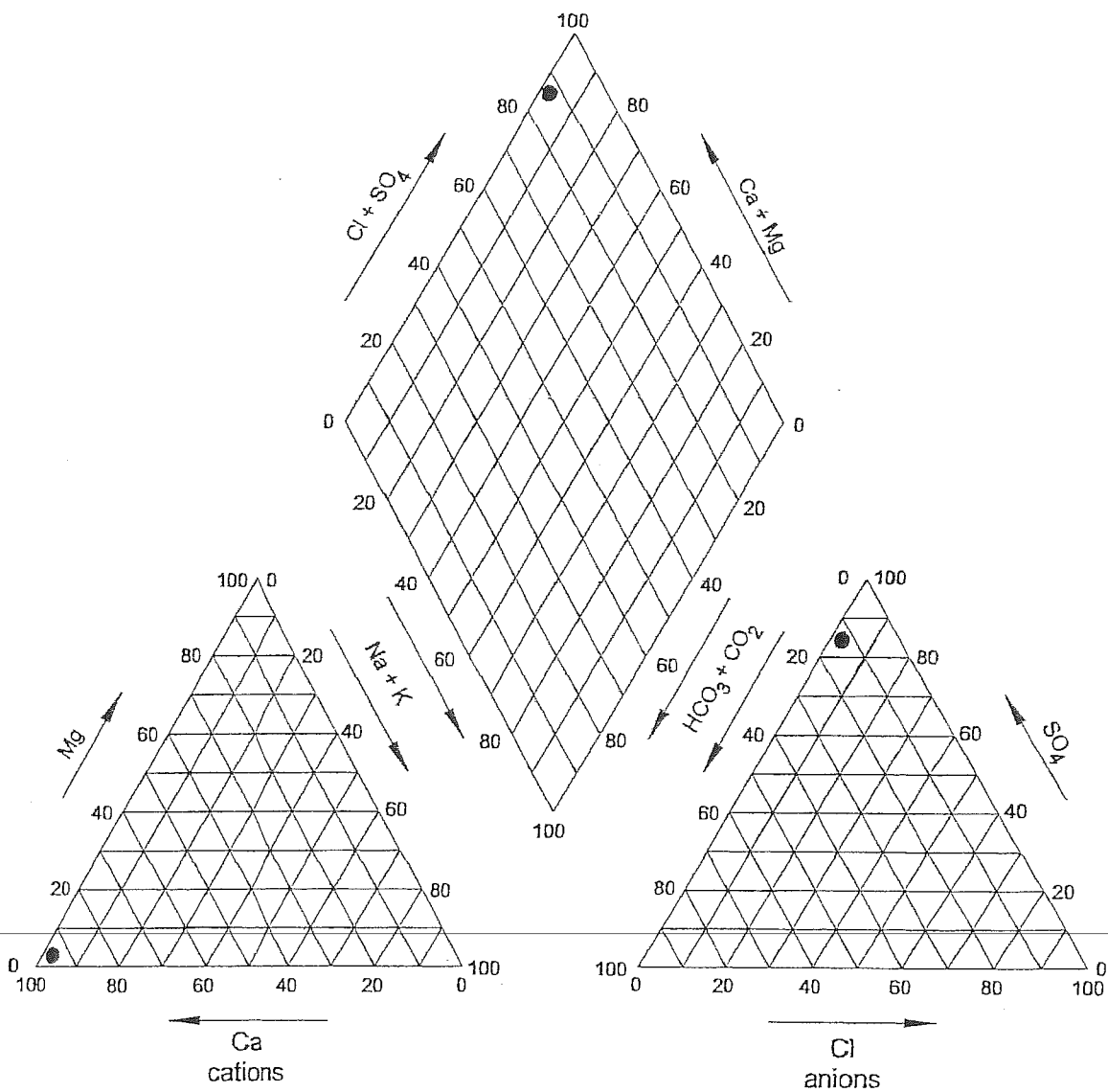
# 6 Pine Lp



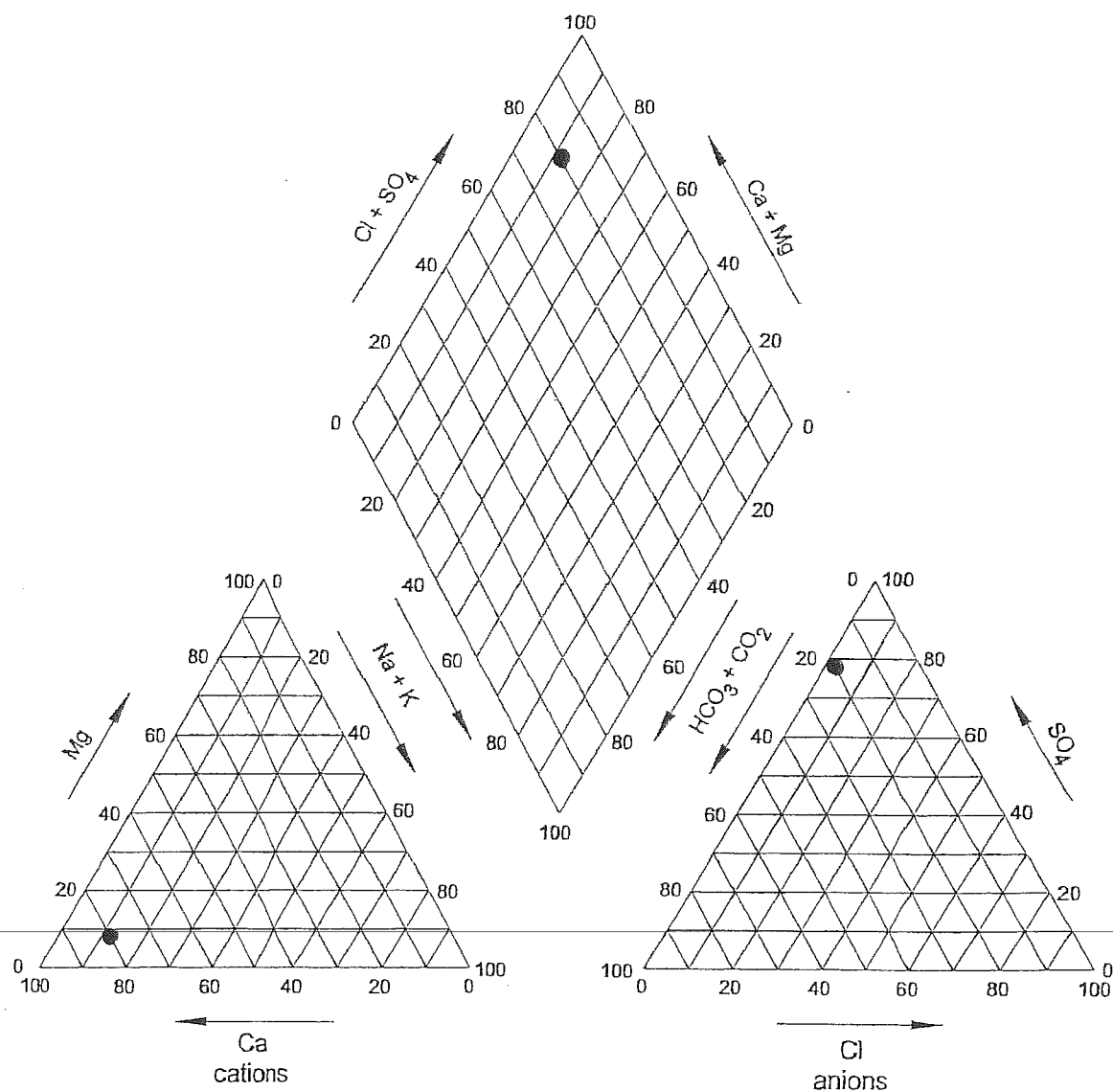
# 64 Juniper Hill Lp



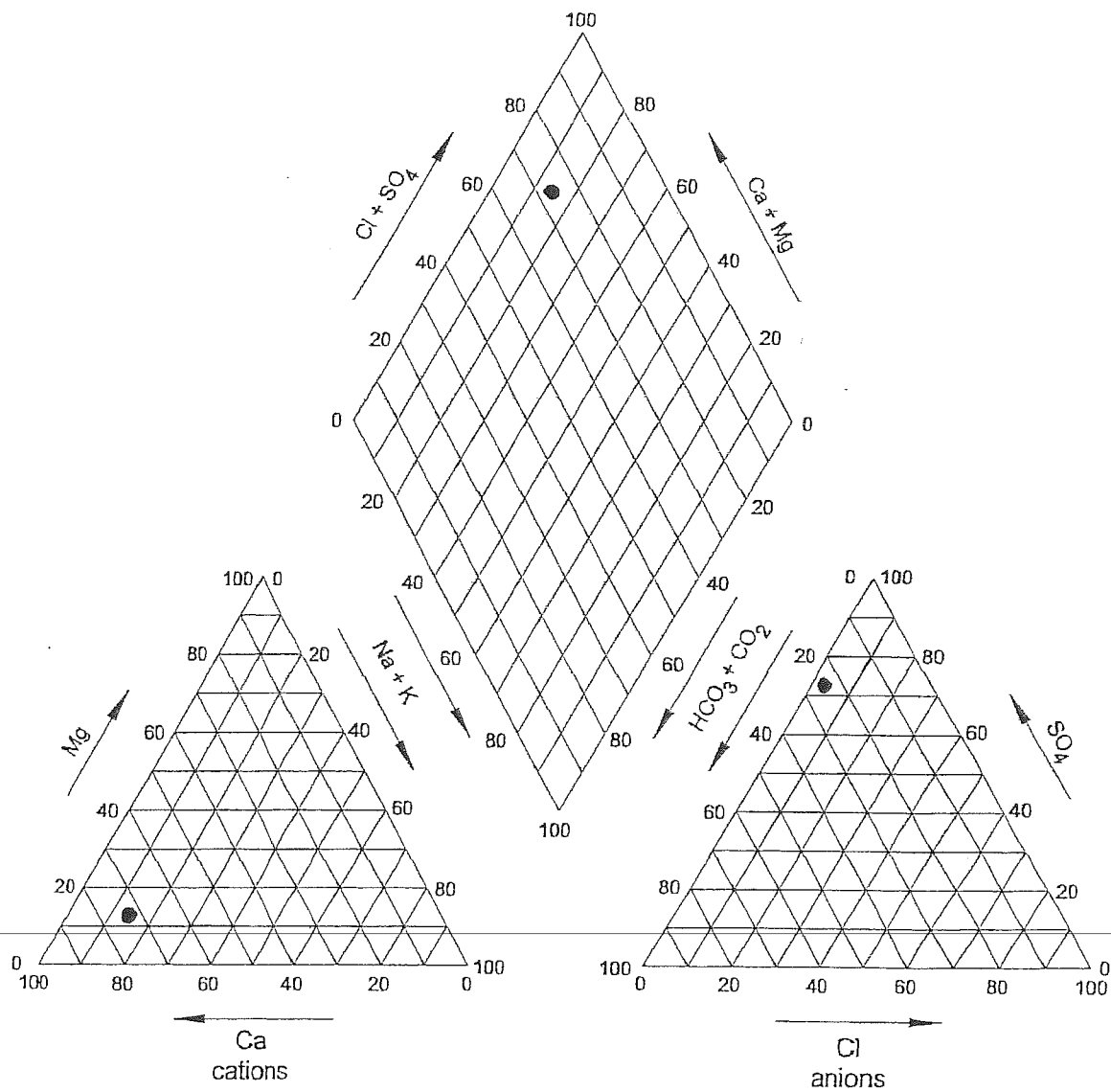
# 5 Pine Pl



## 2 Mulberry Ct

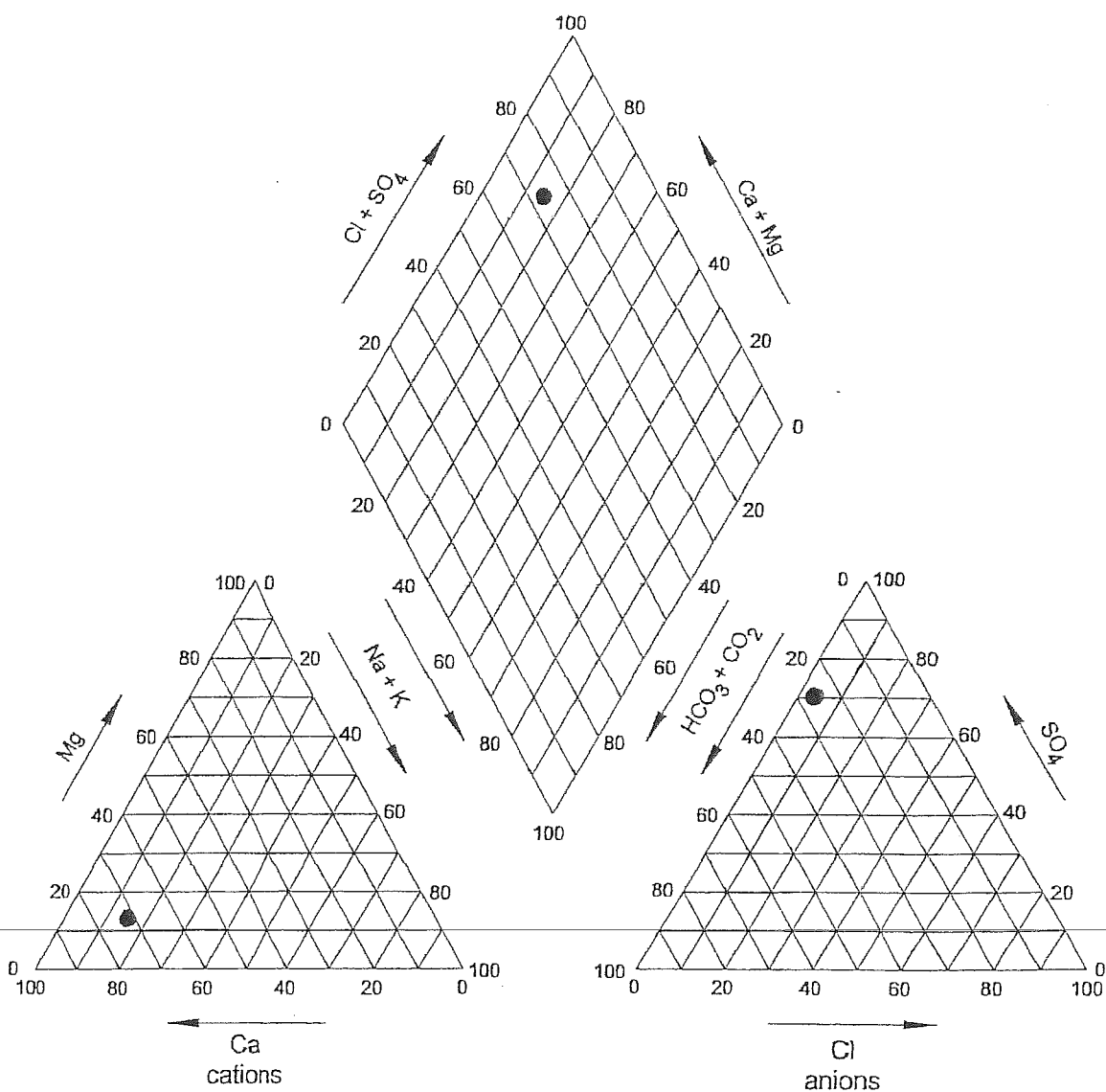


# 4 Juniper Hill Lp





# 5 Juniper Hill PI



## **WATER TYPE 3**

---

# Pinon Ridge Subdivision



## Legend

- Located Wells

Parcel Boundaries

## Water Type

3

- 23 Ridge
- 41 Mulberry Lp
- 12 Cedar Hill Dr
- 5 Mulberry Lp
- 27 Ridge Dr
- 88 Juniper Hill Lp
- 87 Juniper Hill Lp
- 91 Juniper Hill Lp

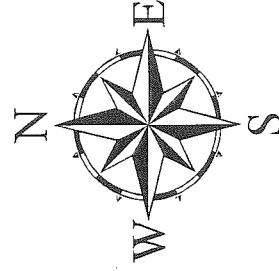
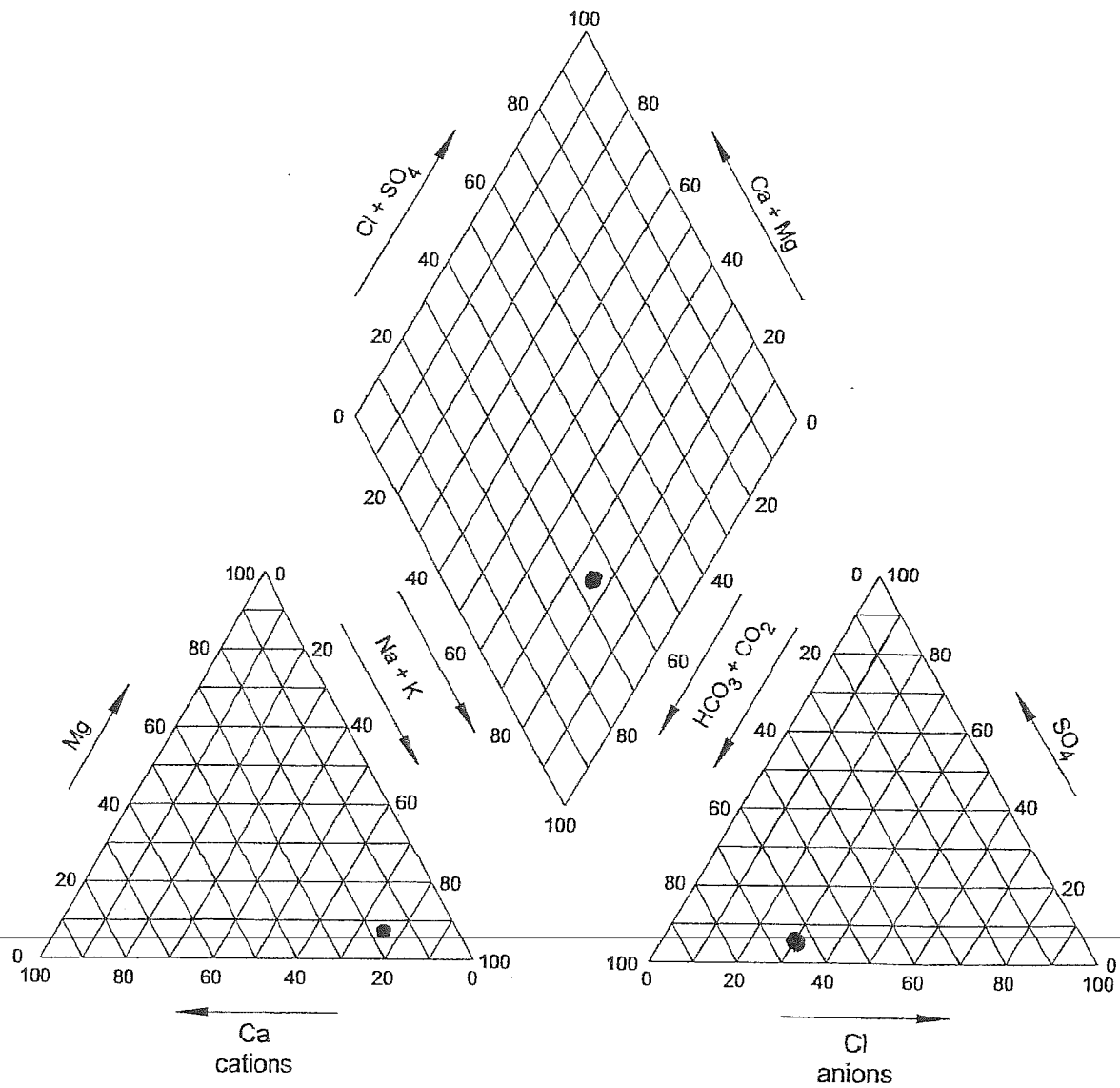


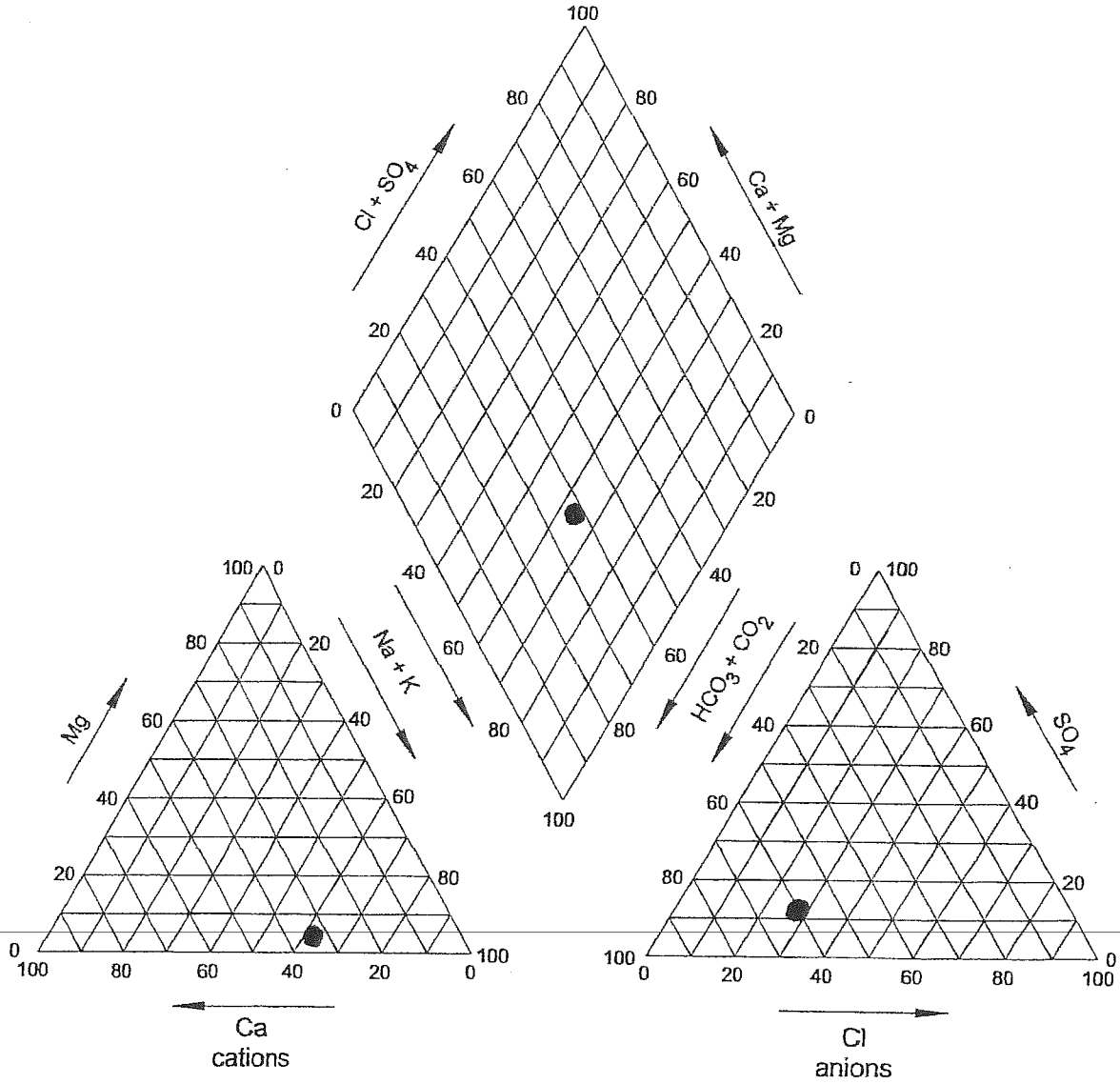
FIGURE 6

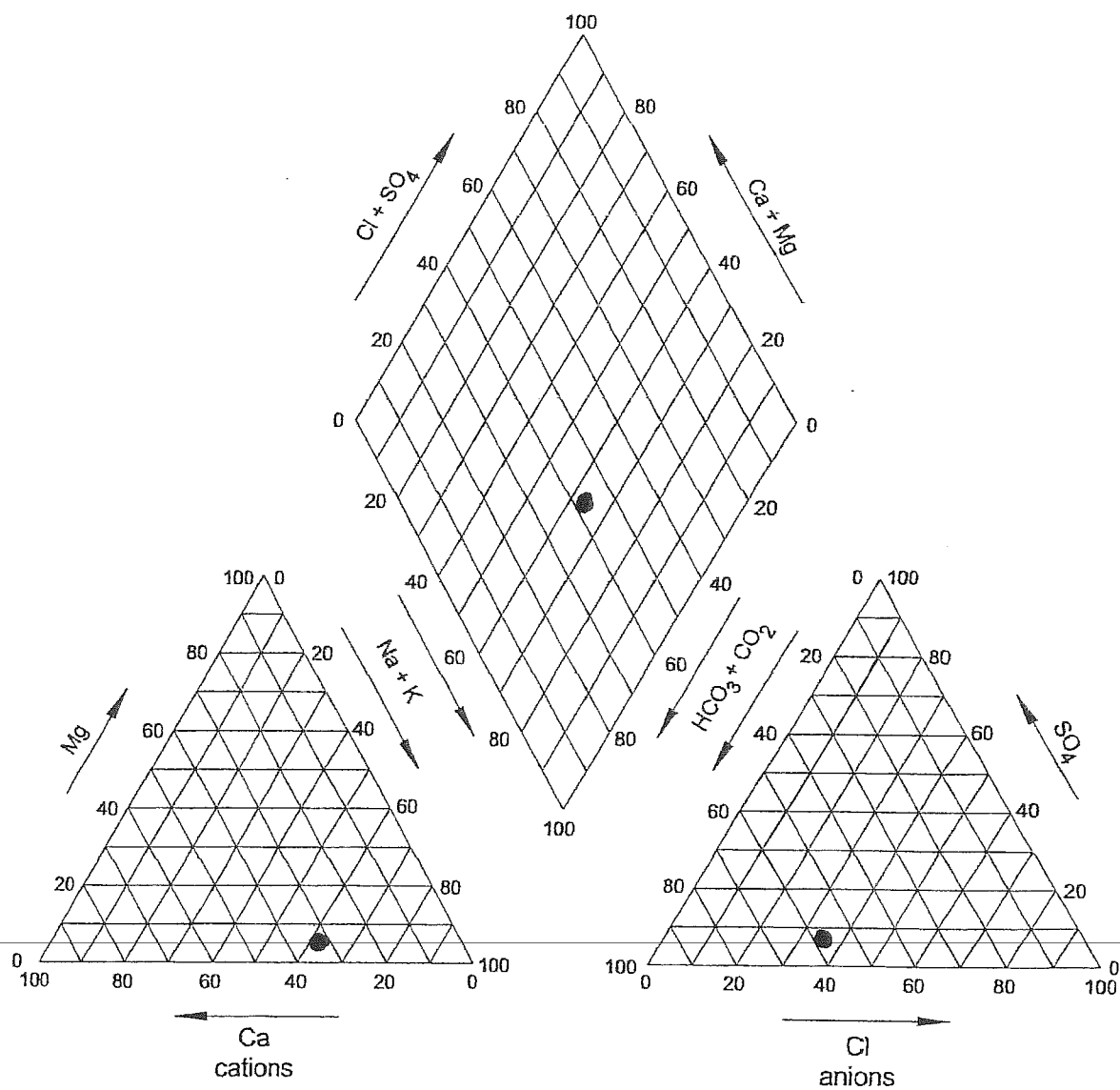


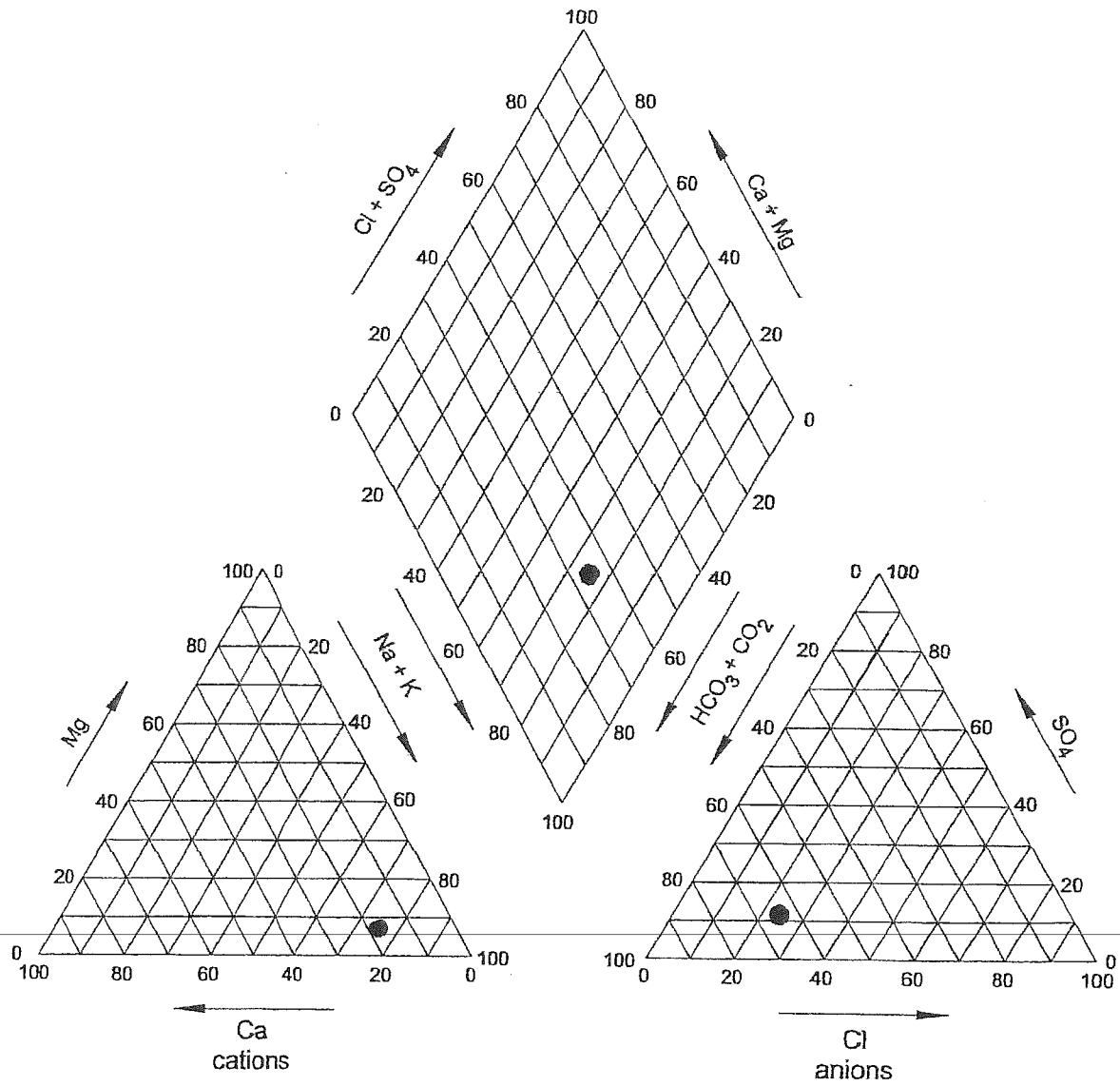
# 97 Juniper Hill Lp



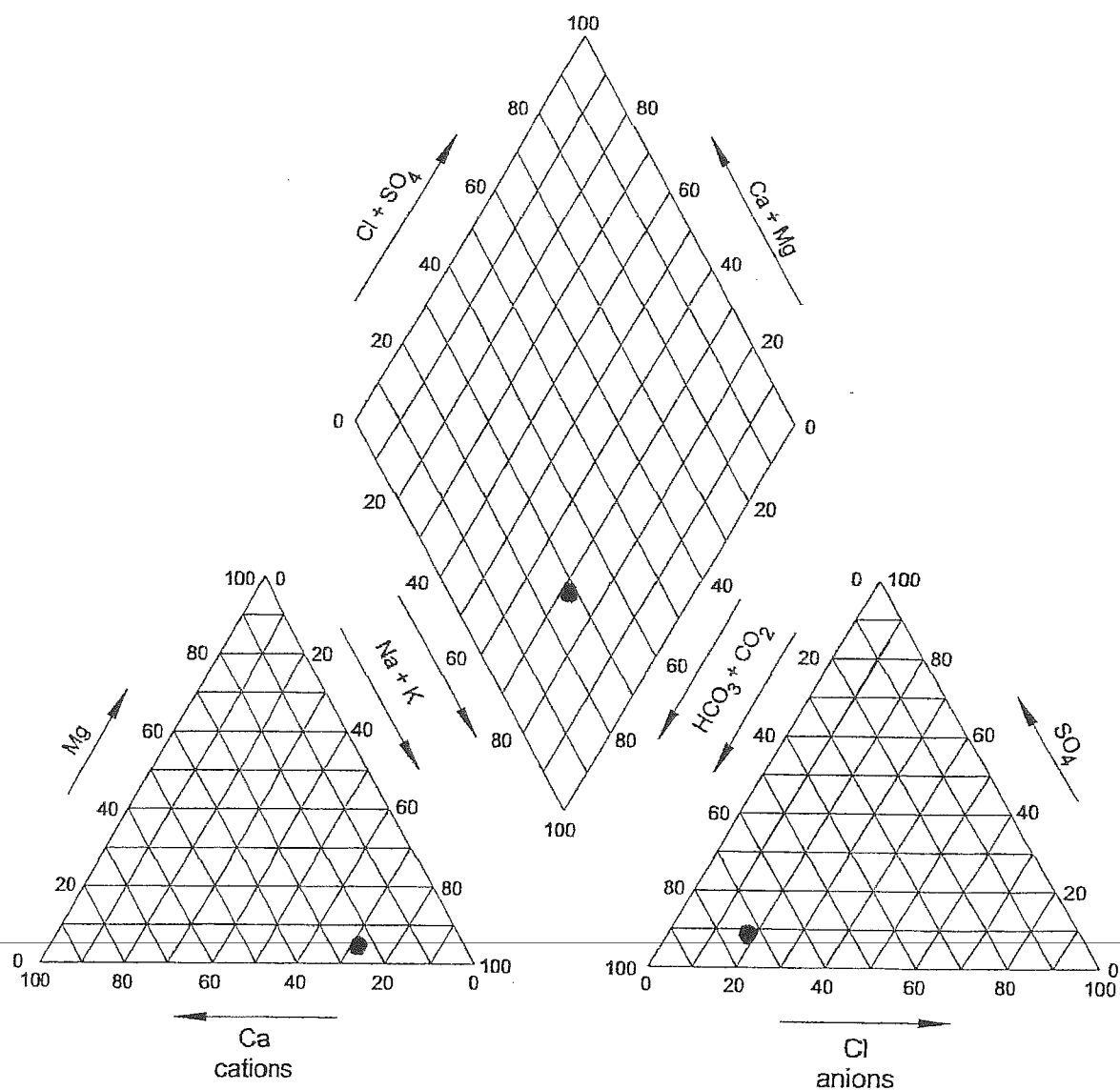
41 Mulberry Lp



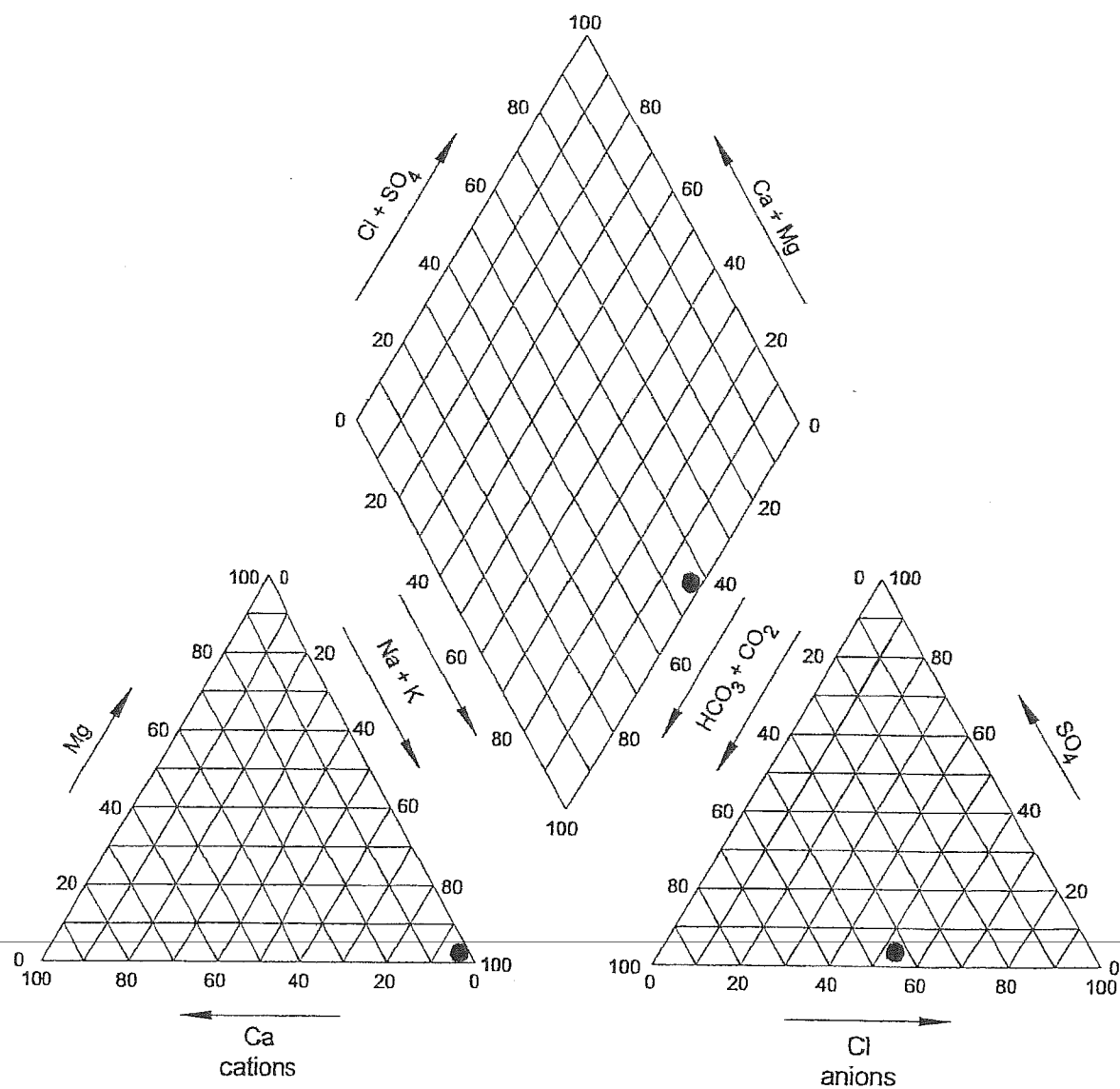




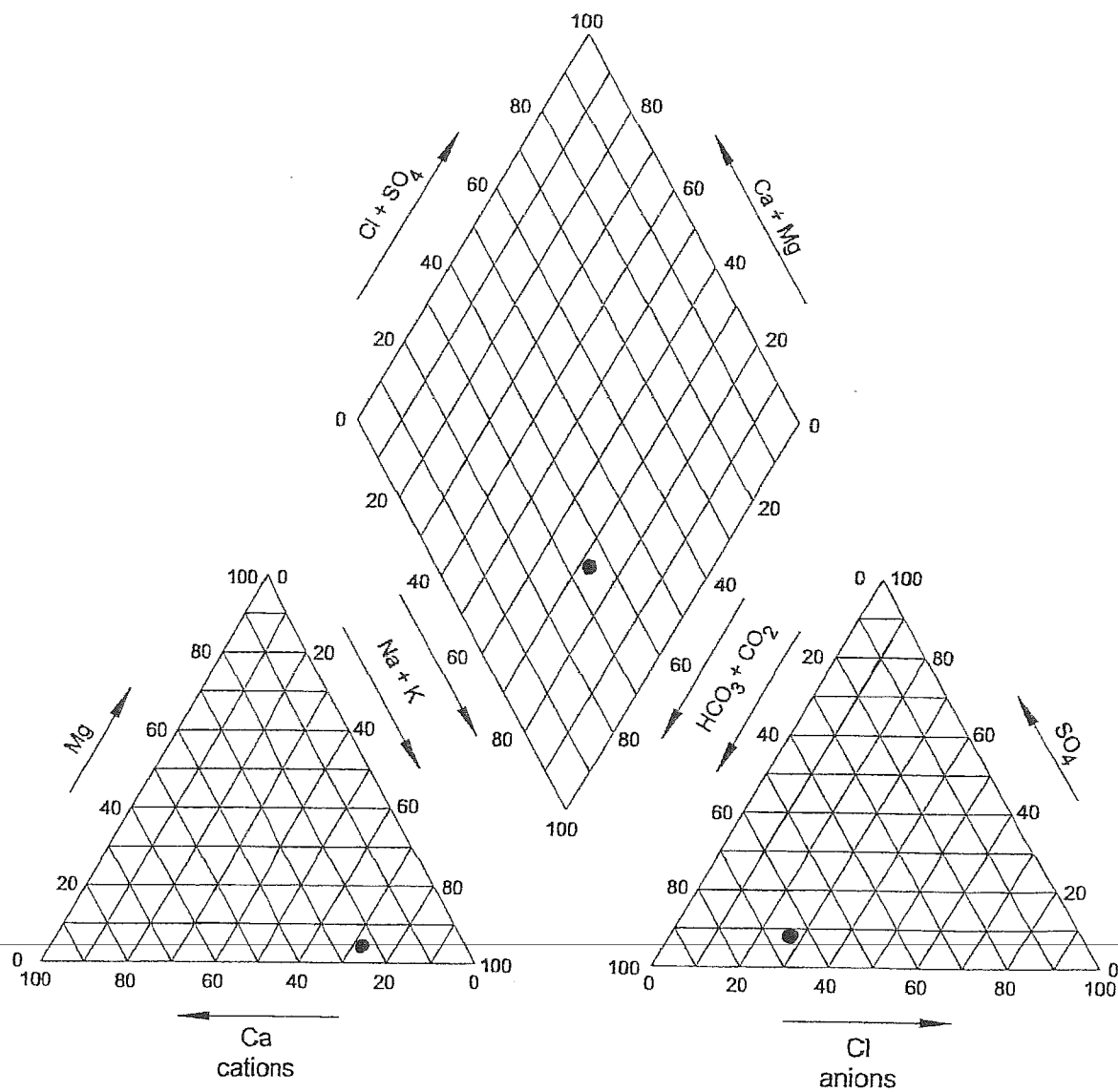
# 88 Juniper Hill Lp



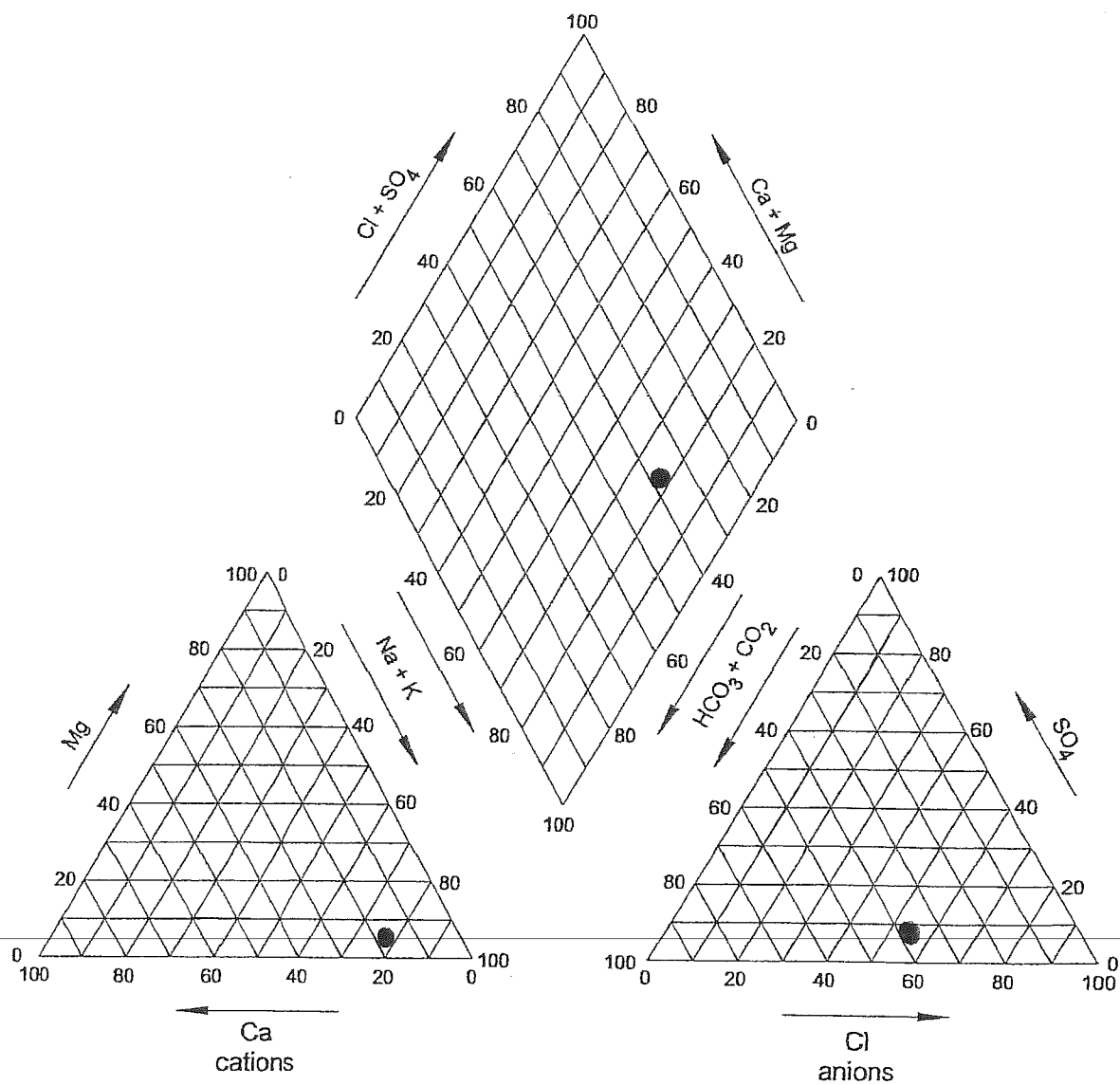




# 91 Juniper Hill Lp



# 5 Mulberry Lp



## **WATER TYPE 4**

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# Pinon Ridge Subdivision



## Legend

- Located Wells

Parcel Boundaries

## Water Type

4

3 Mulberry Lp  
8 Cedar Hill Dr  
38 Juniper Hill Lp  
Right of Way (not mapped)

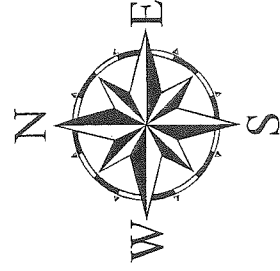
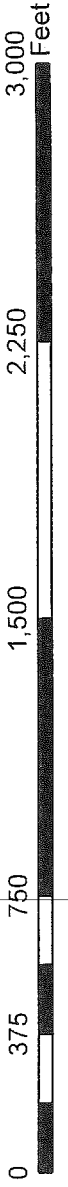
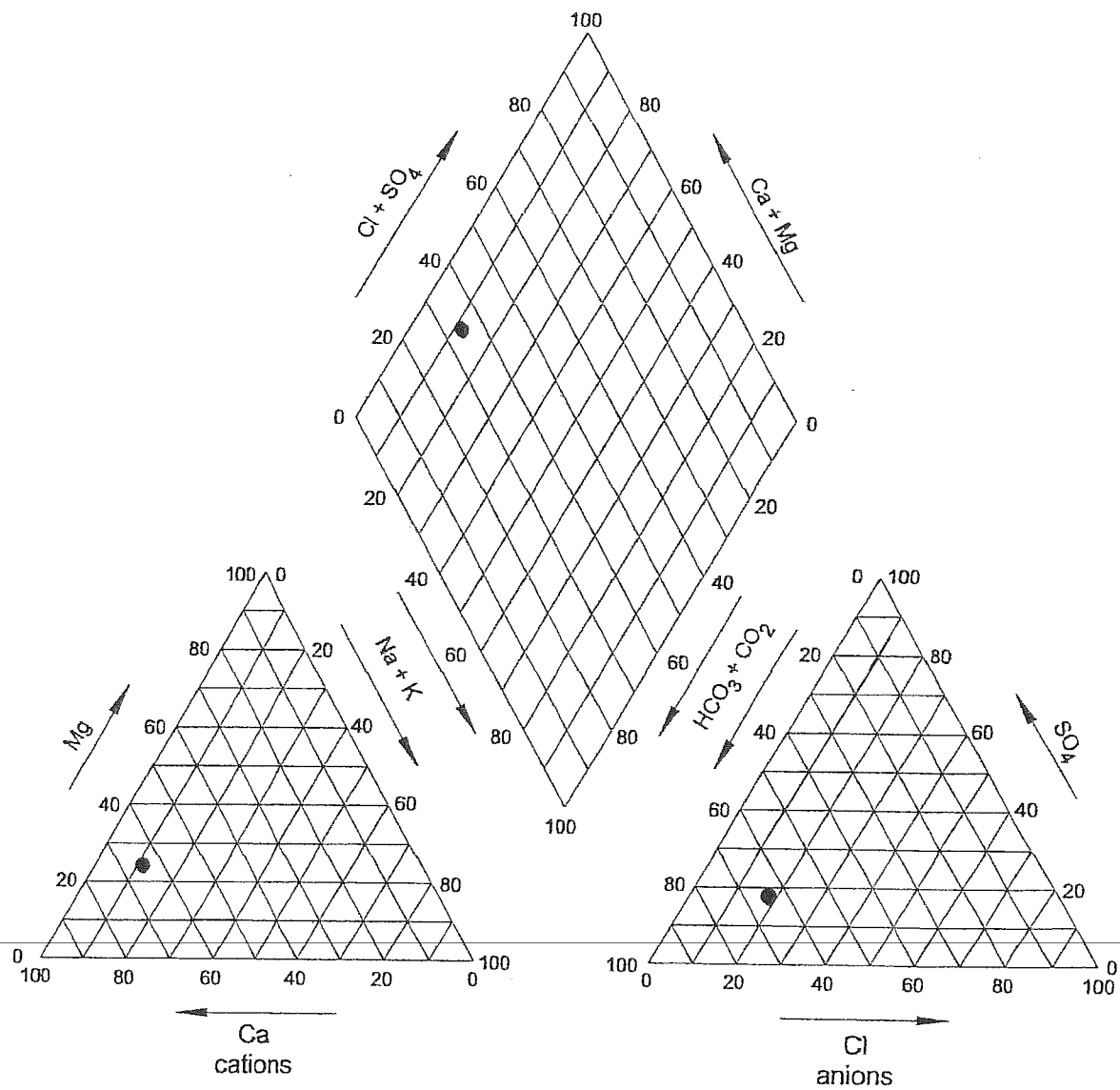
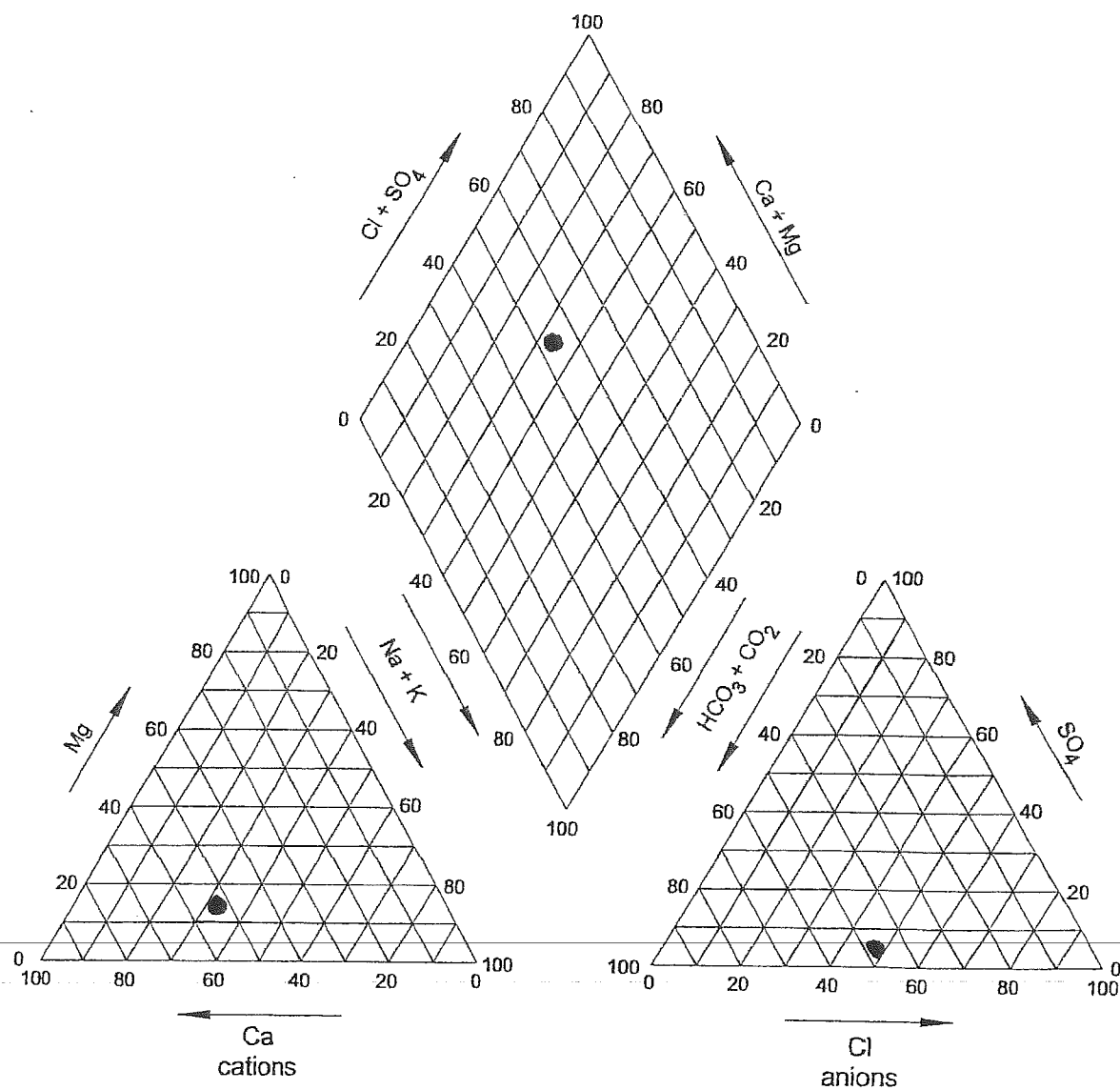


FIGURE 7

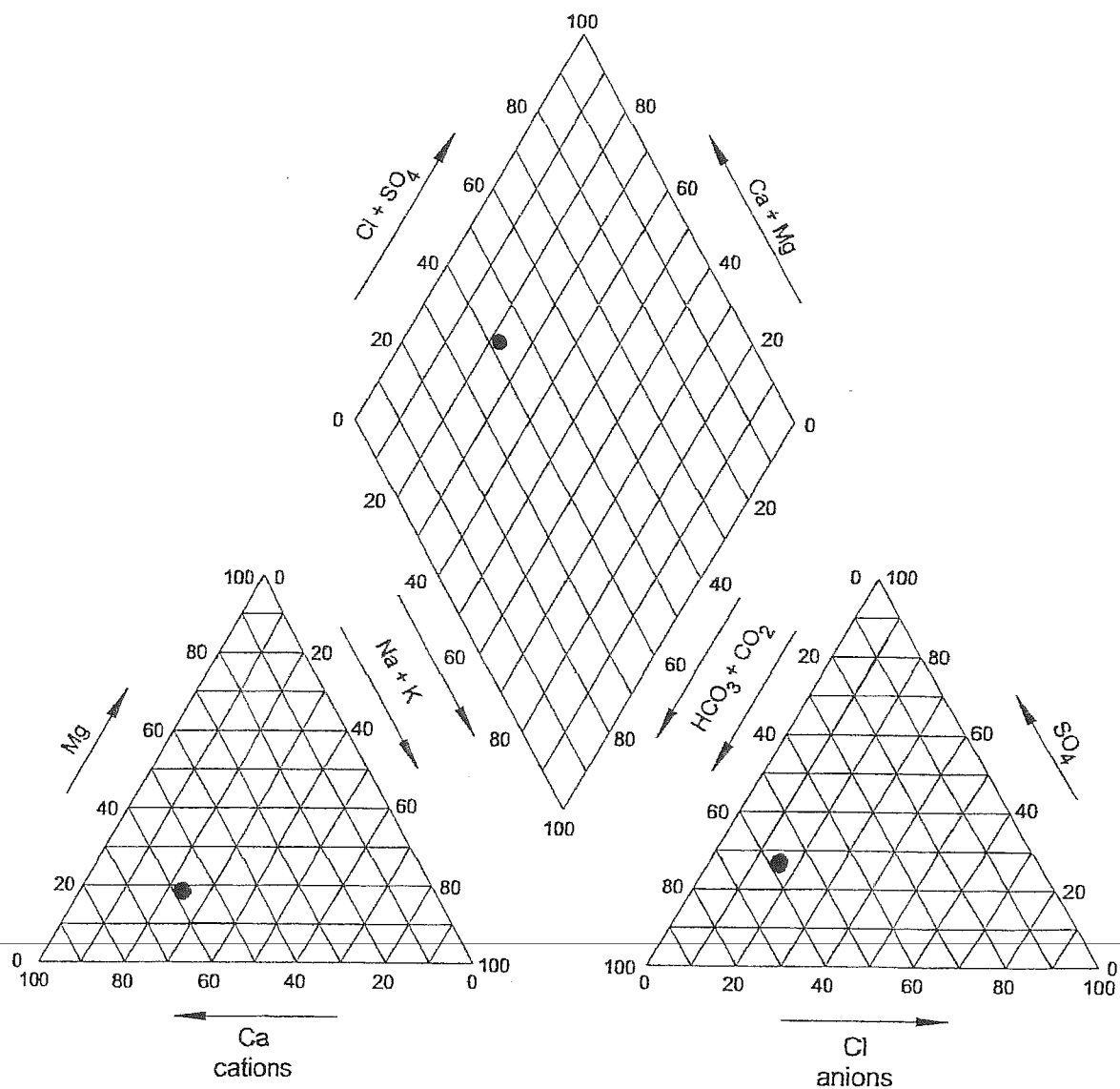


# Right of way



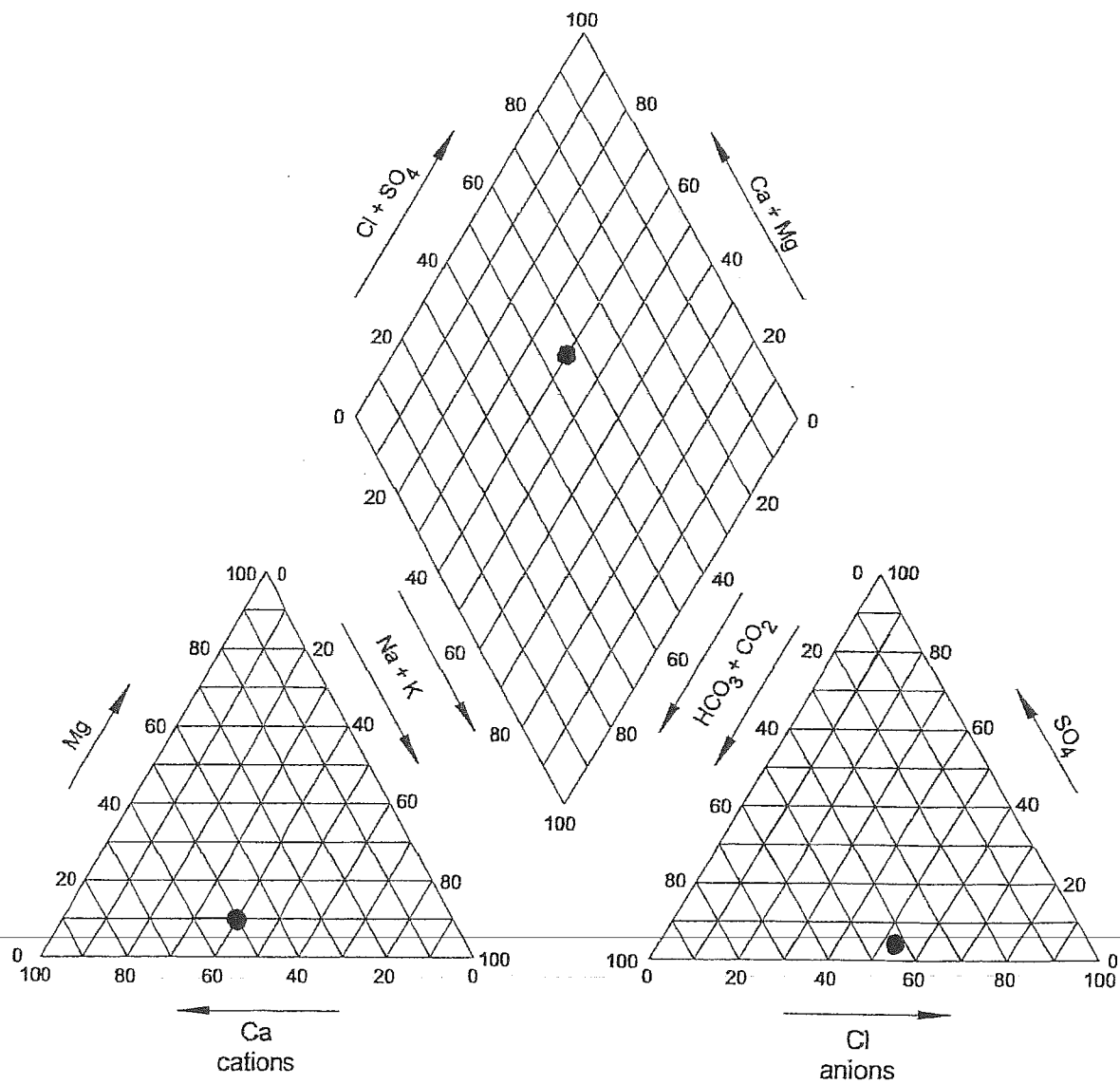


# 38 Juniper Hill Lp





### 3 Mulberry Lp



## **WATER TYPE 5**

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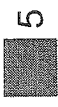
# Pinon Ridge Subdivision



## Legend

- Located Wells
- Parcel Boundaries

## Water Type



5

- 32 Ridge Dr
- 7 Dedar Hill Lp
- 24 Ridge Dr
- 27 Pine Lp
- 10 Fir Lp
- 5 Sycamore Dr
- 22 Juniper Hill Lp
- 16 Juniper Hill Lp
- 102 Juniper Hill Lp
- 32 Juniper Hill Lp

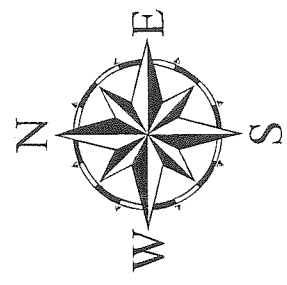
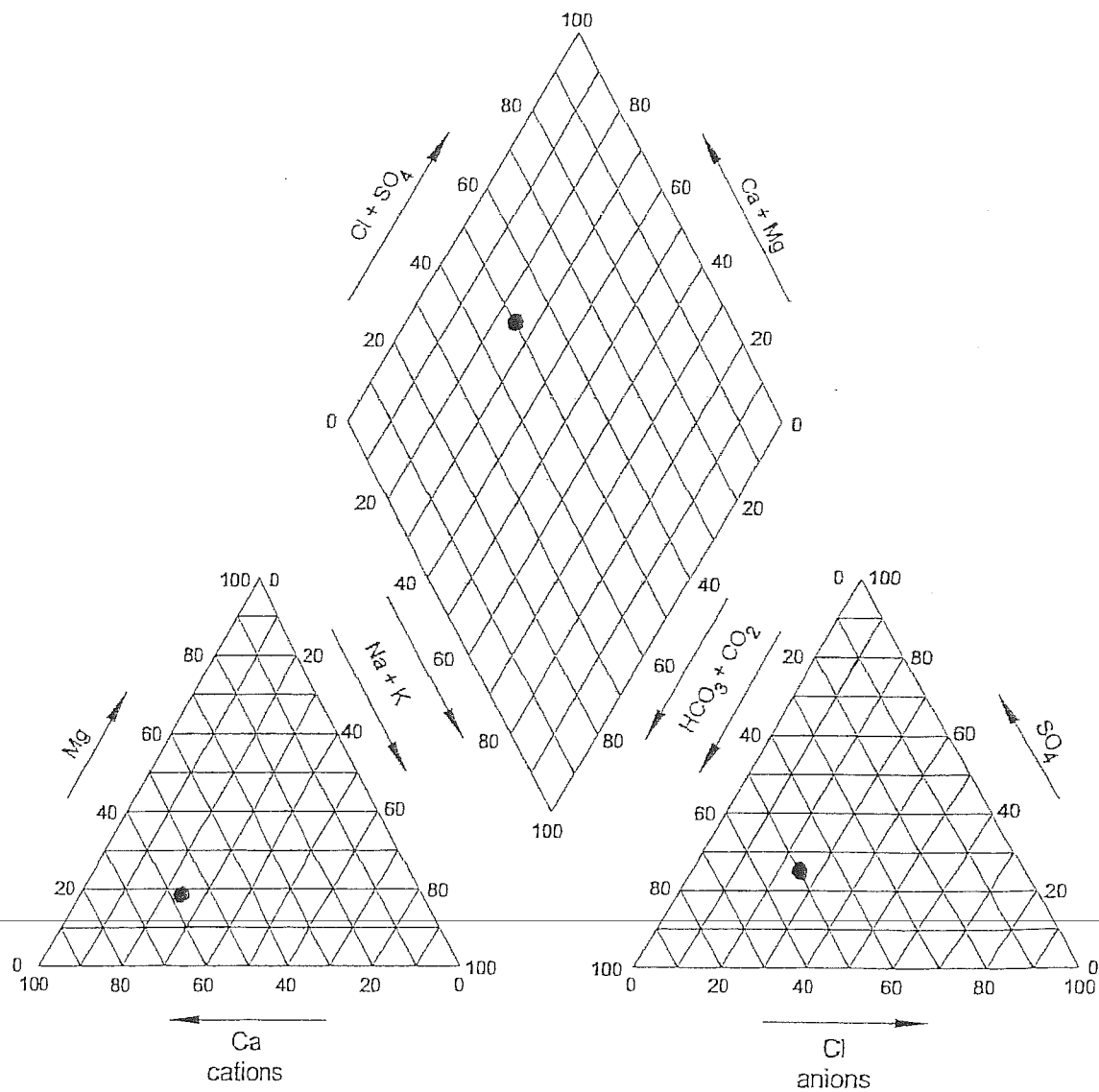
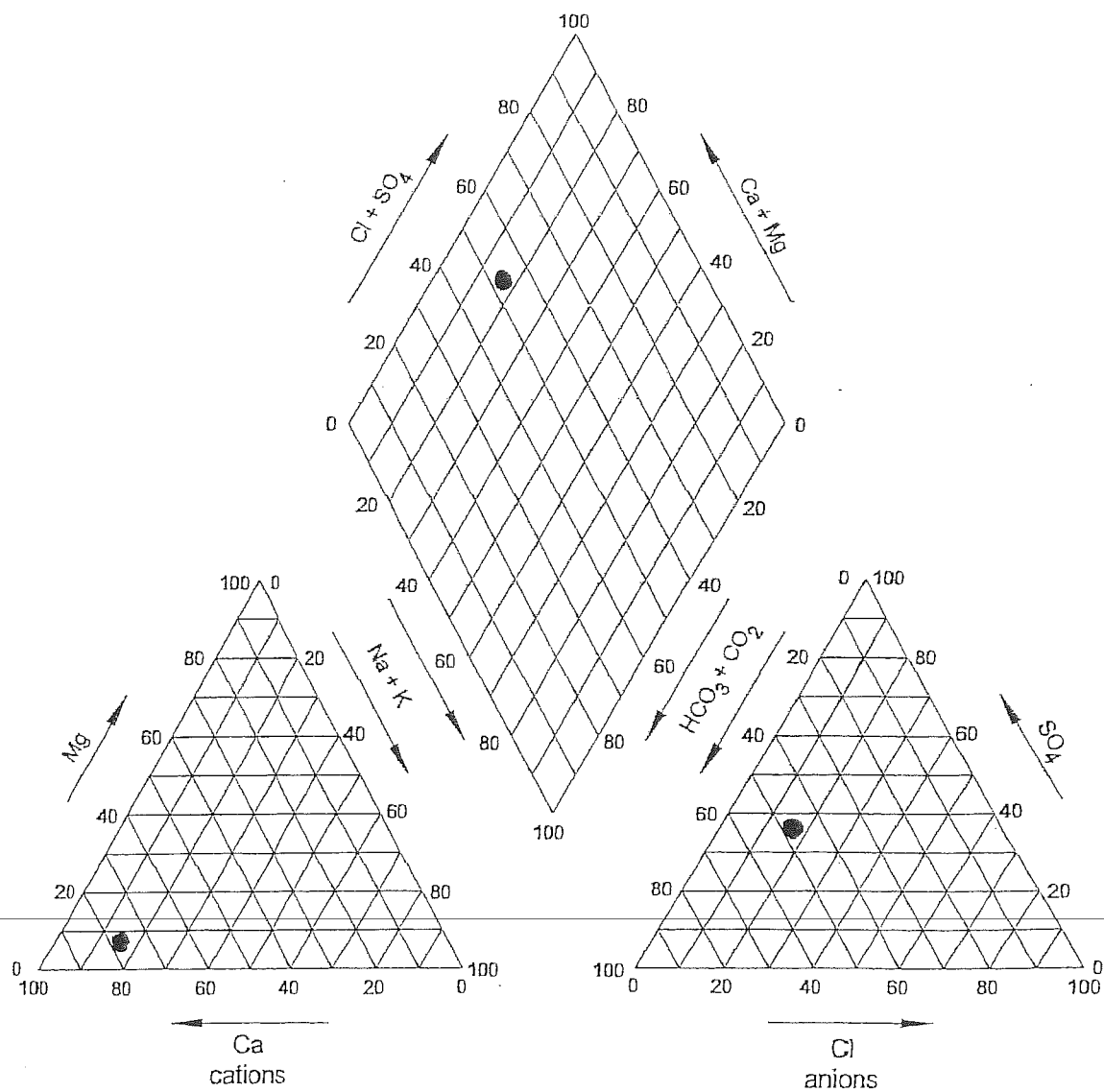


FIGURE 8

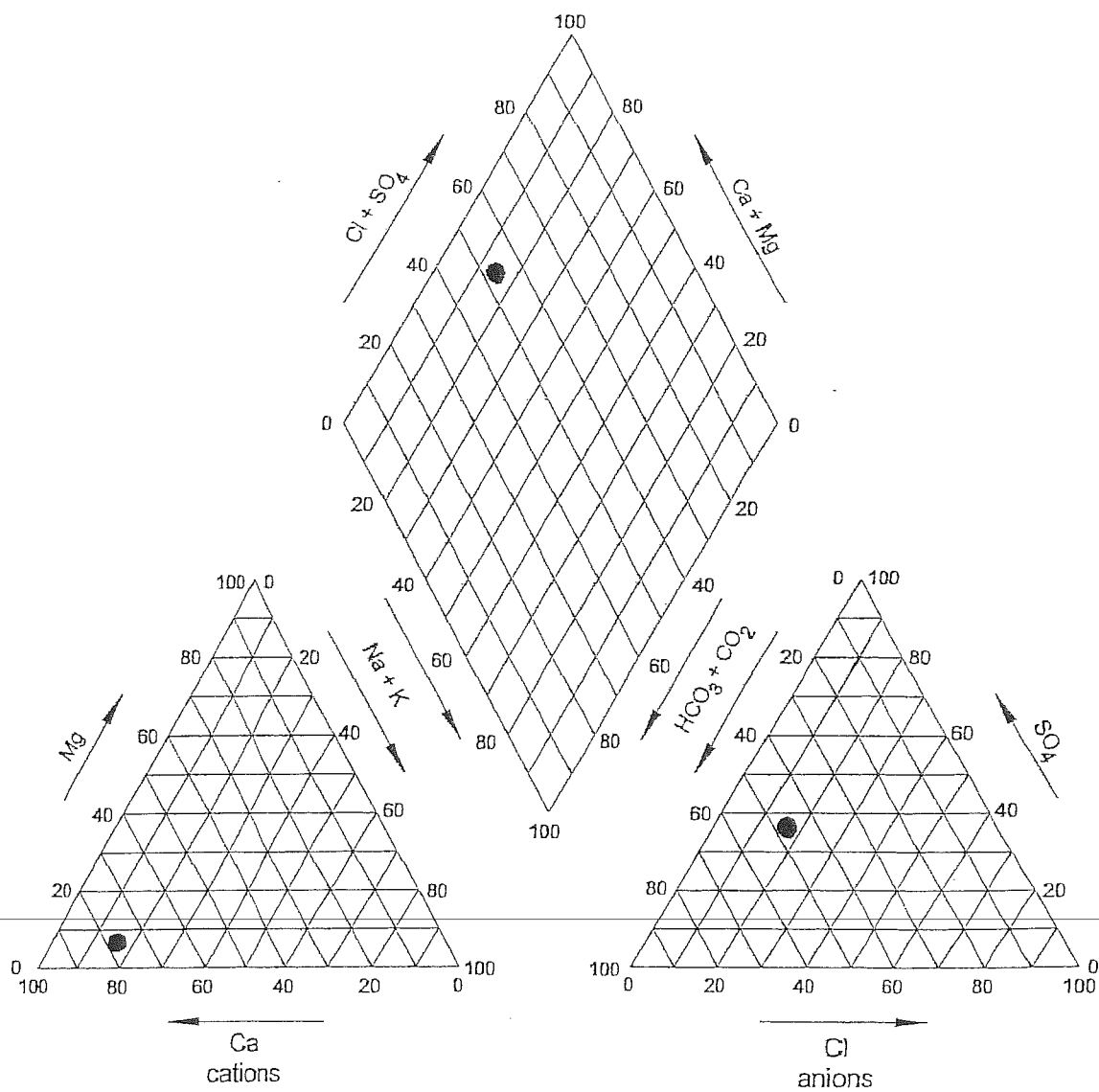


# 32 Juniper Hill Lp

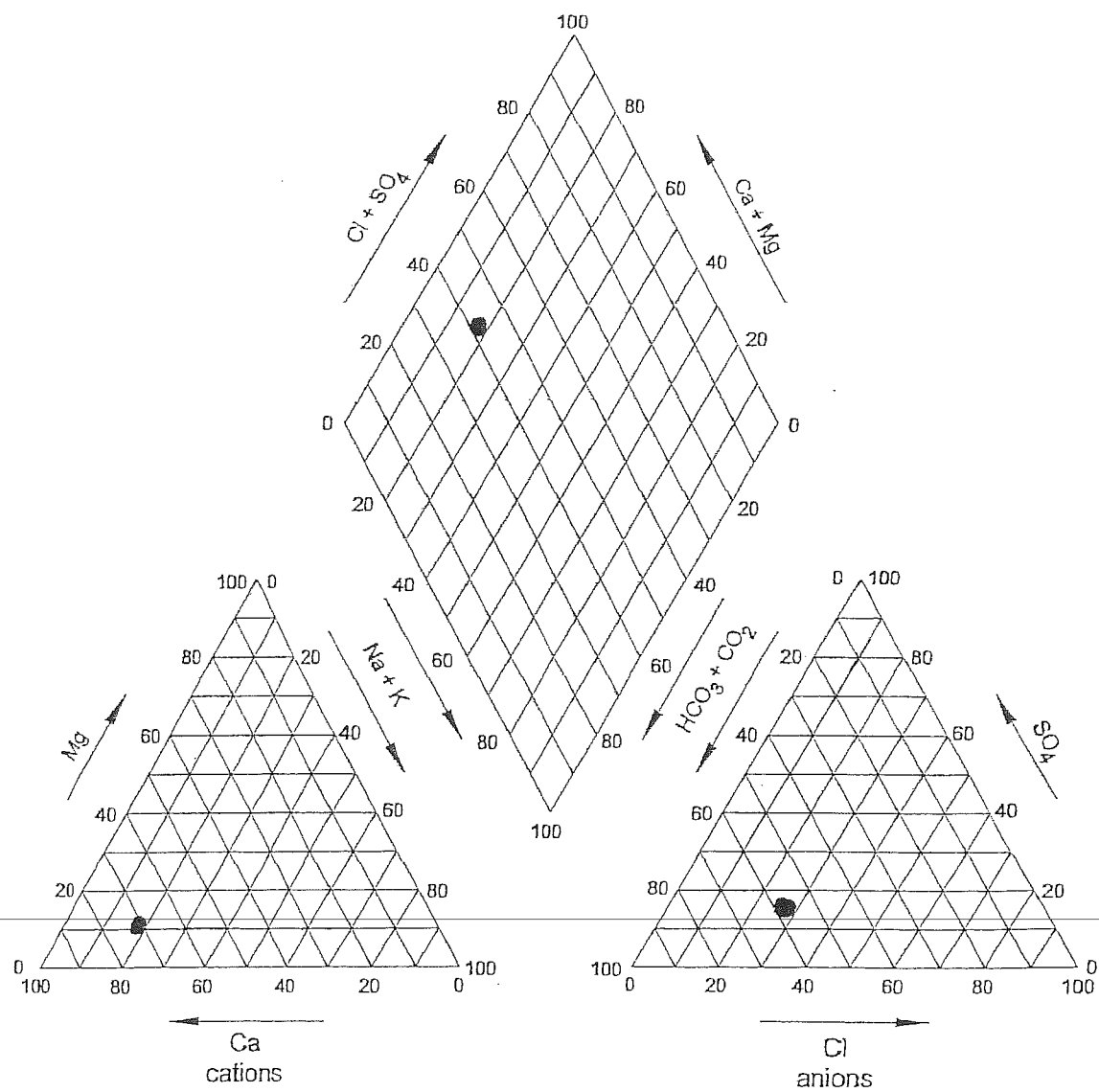




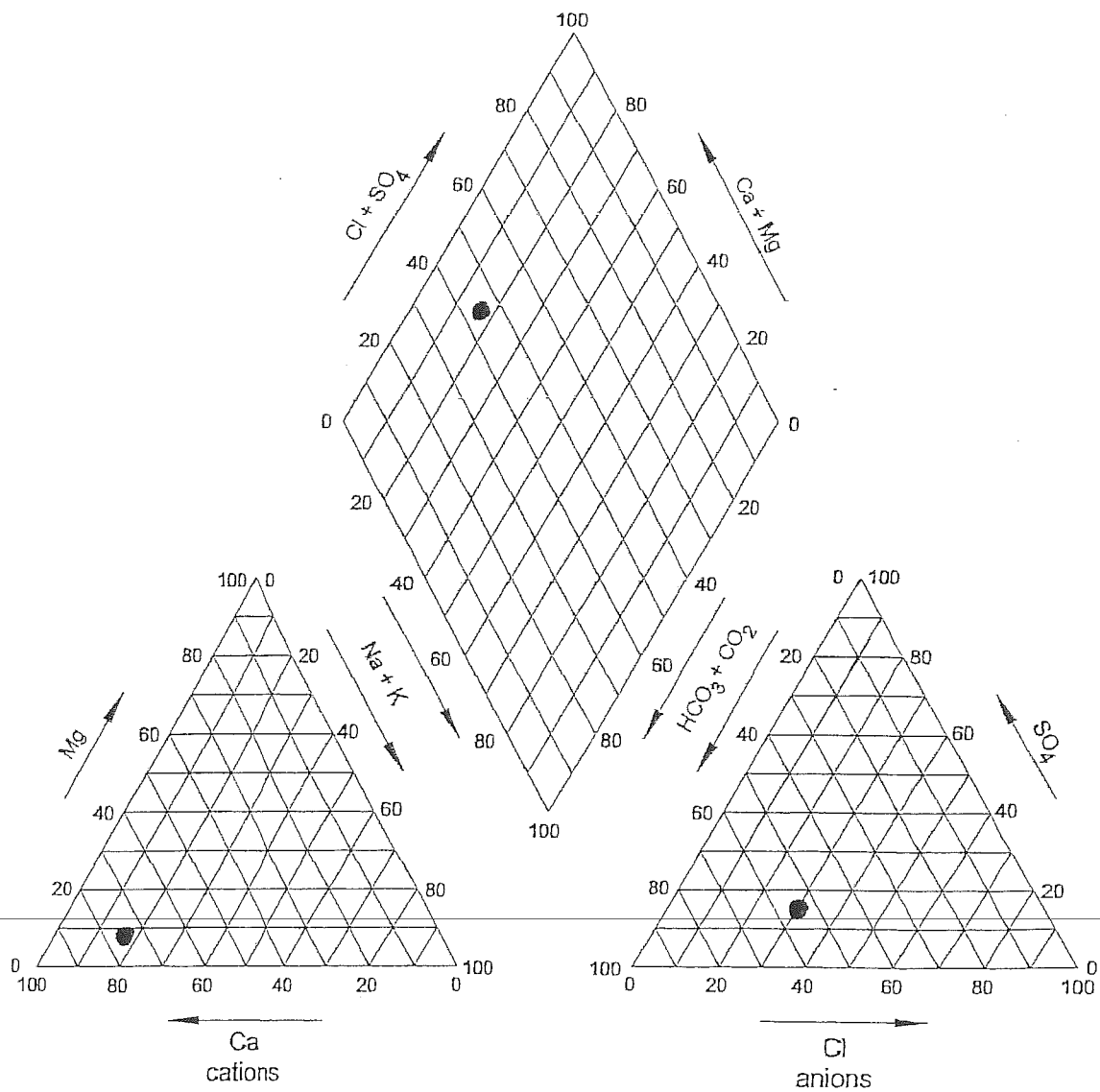
# 7 Cedar Hill Lp



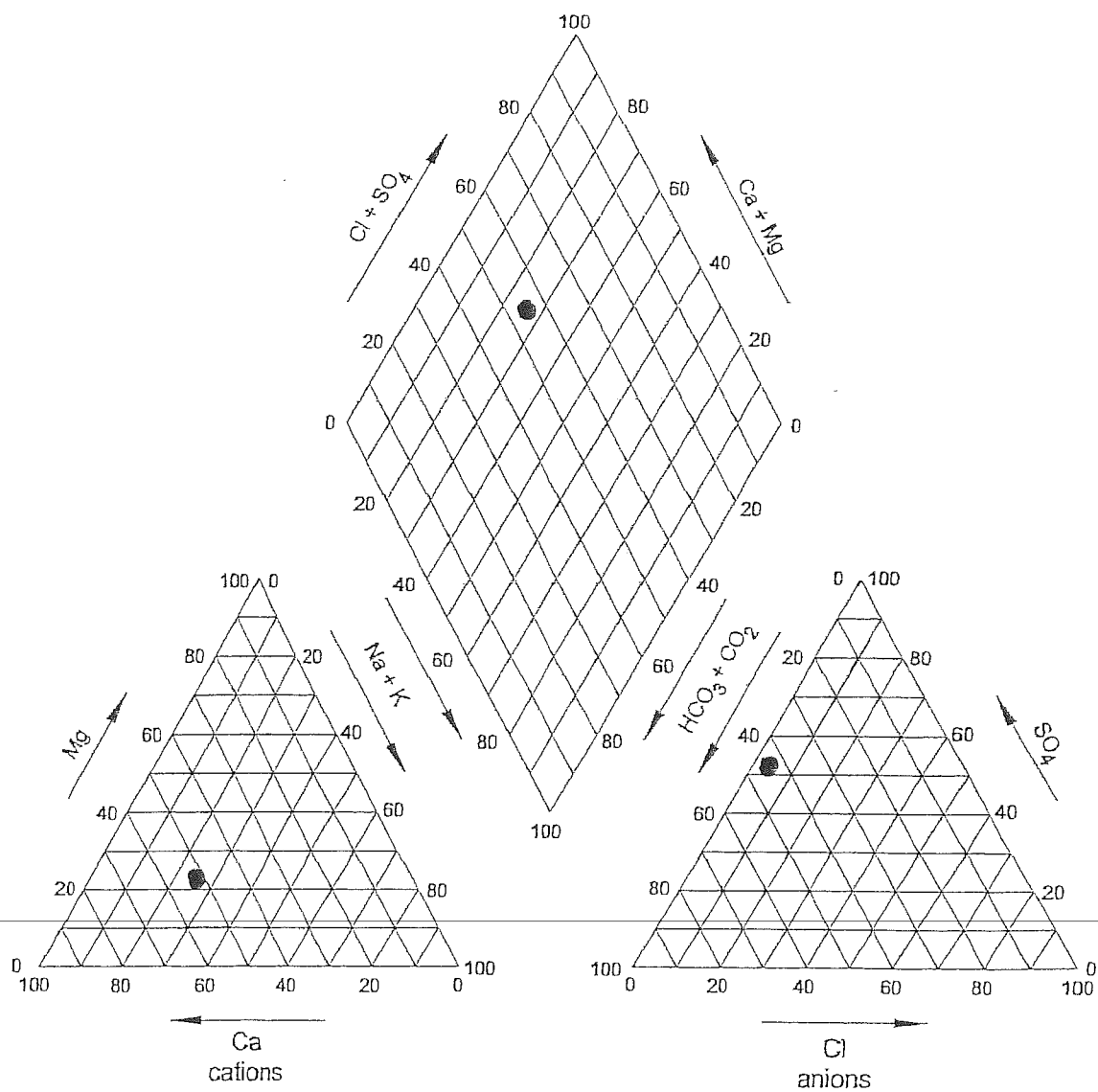
# 24 Ridge Dr



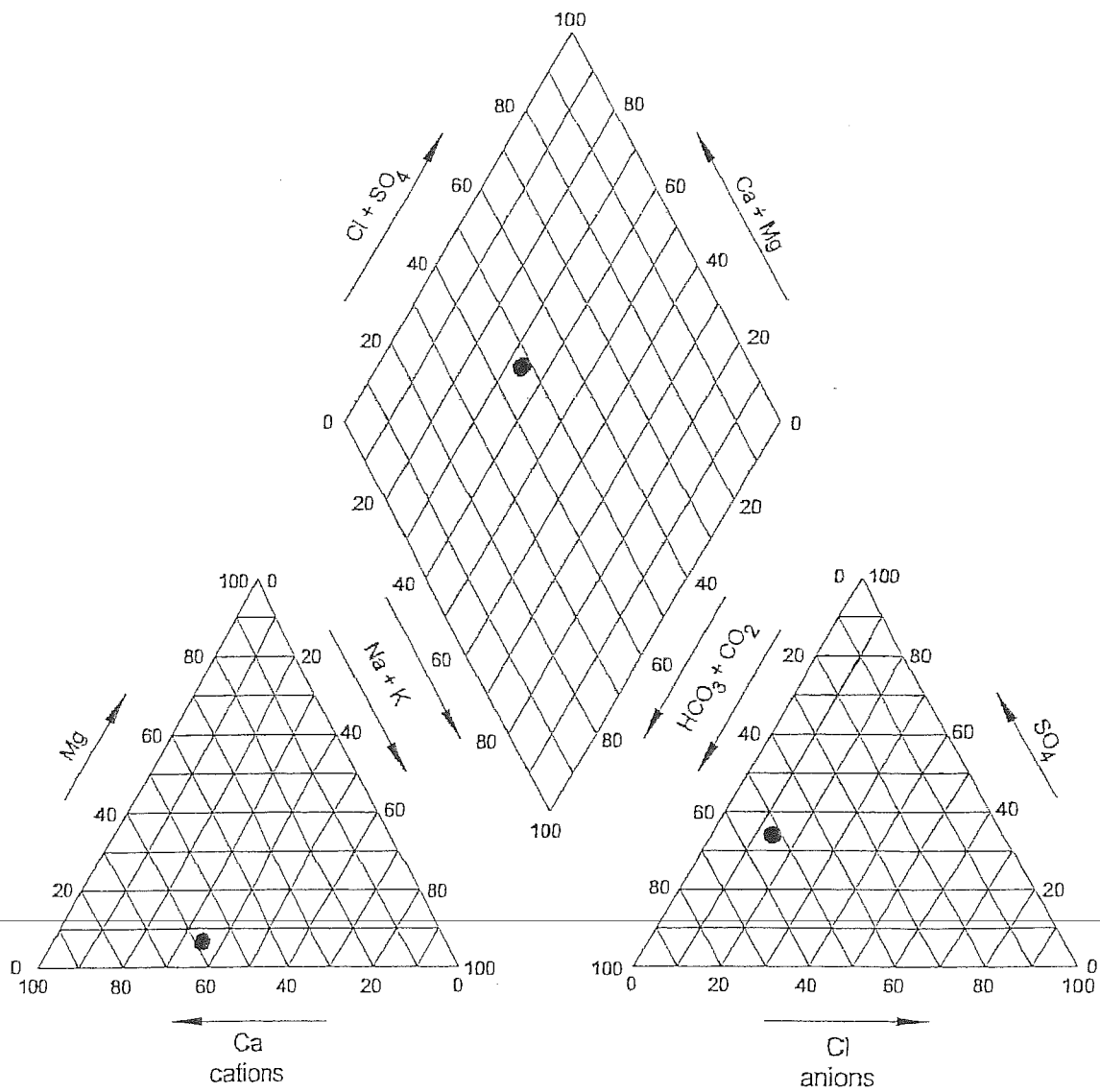
# 27 Pine Lp



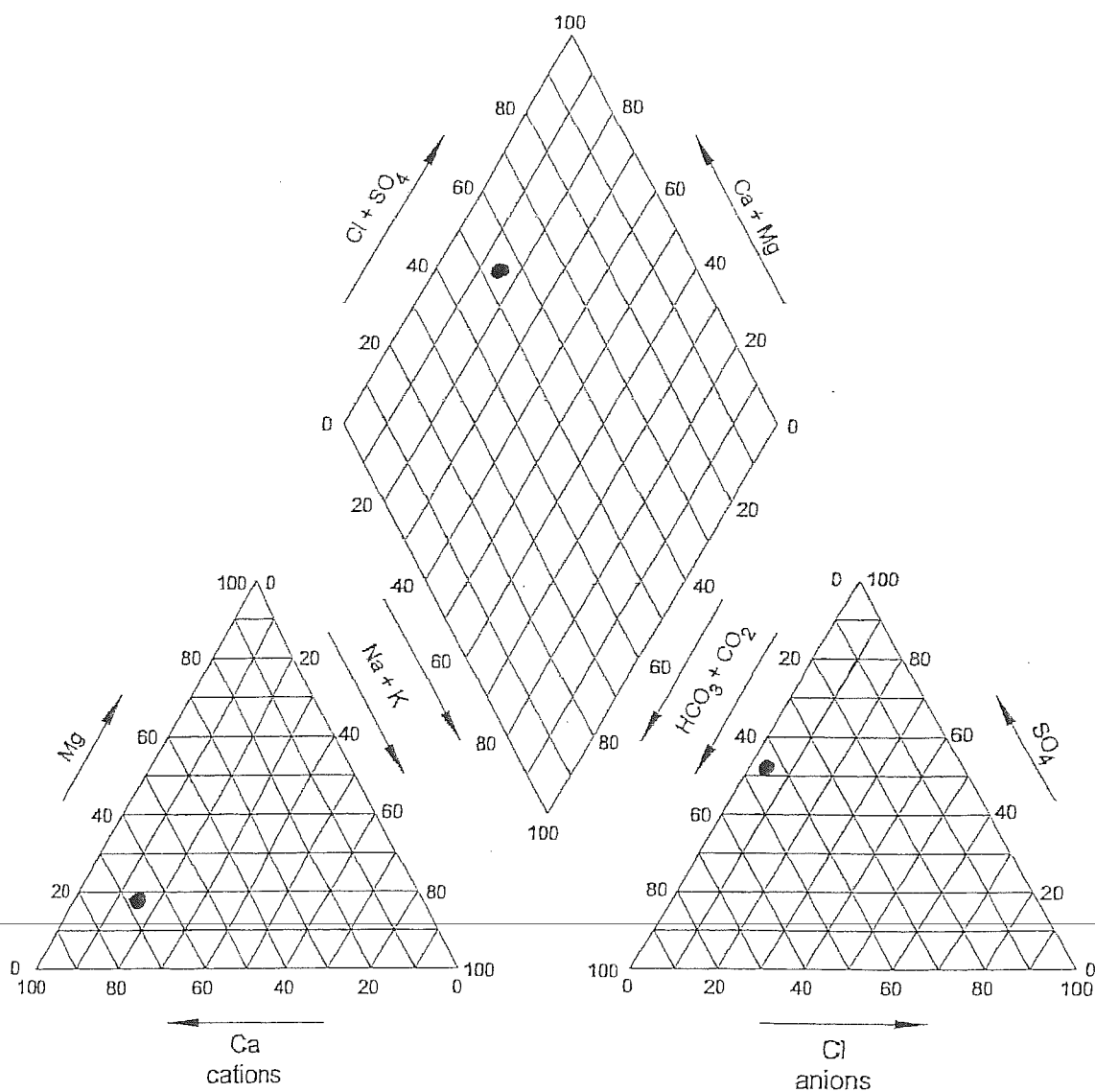




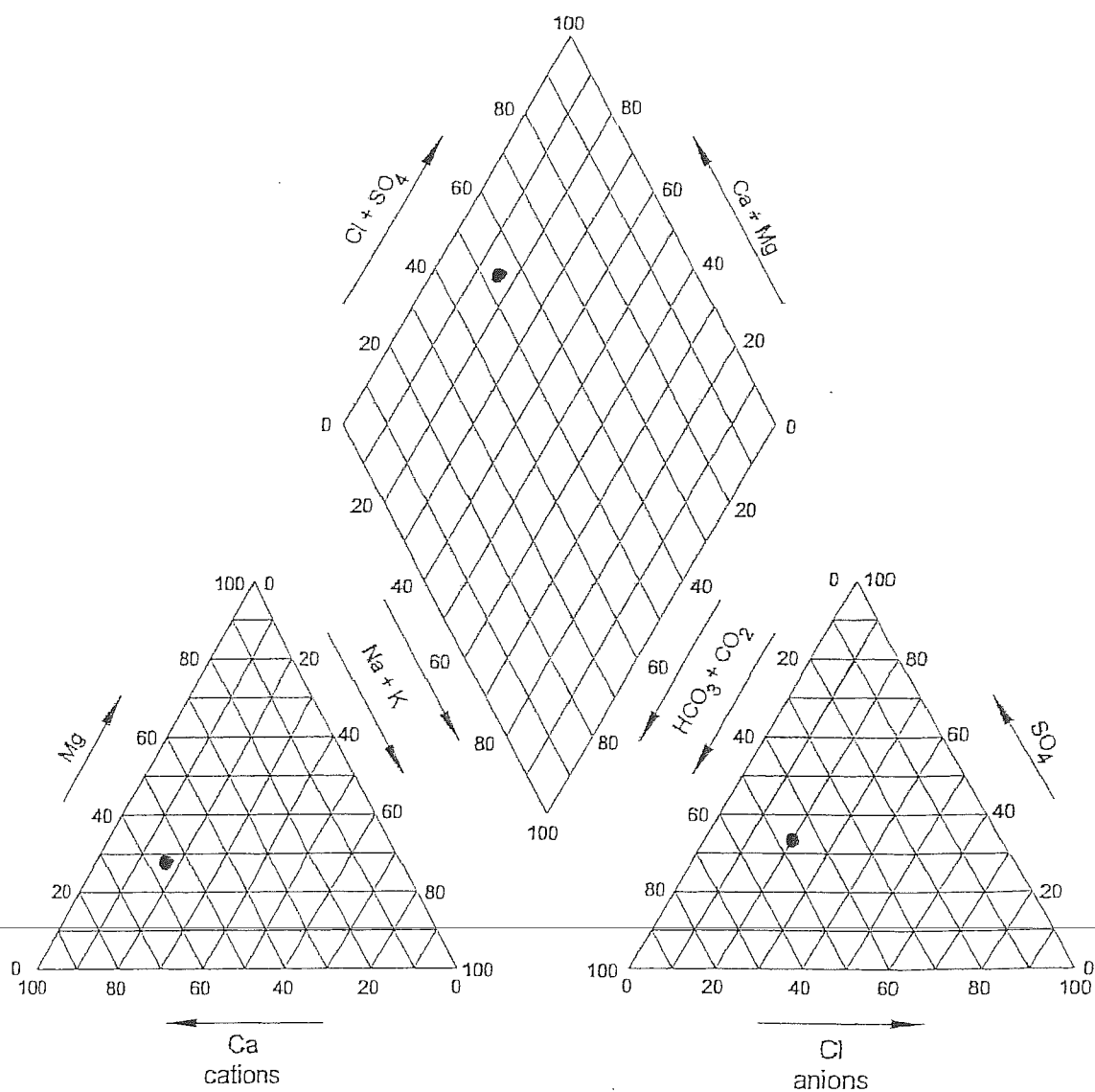
# 5 Sycamore Dr



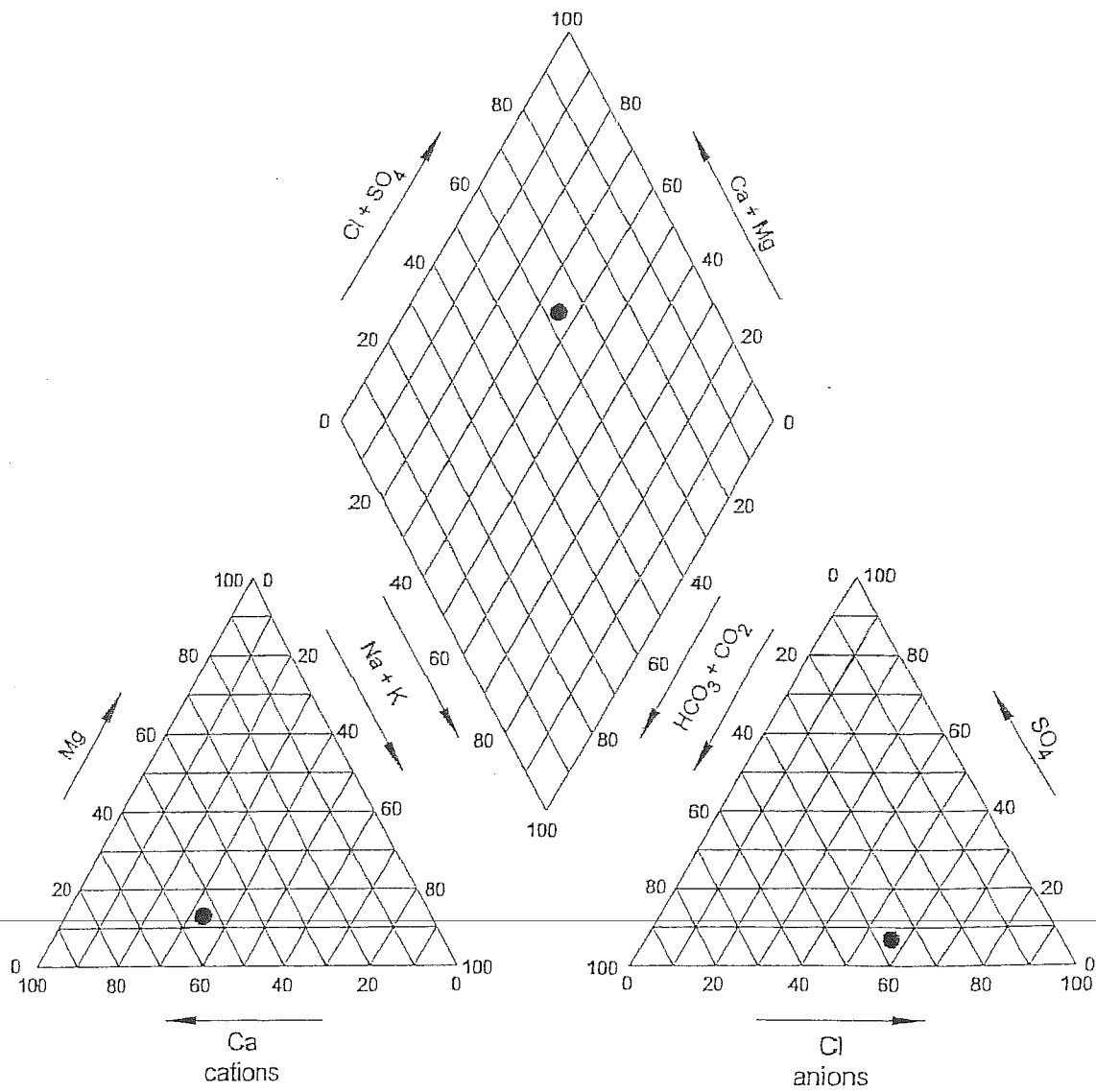
# 22 Juniper Hill Lp



# 16 Juniper Hill Lp



# 102 Juniper Hill Lp



## **WATER TYPE 6**

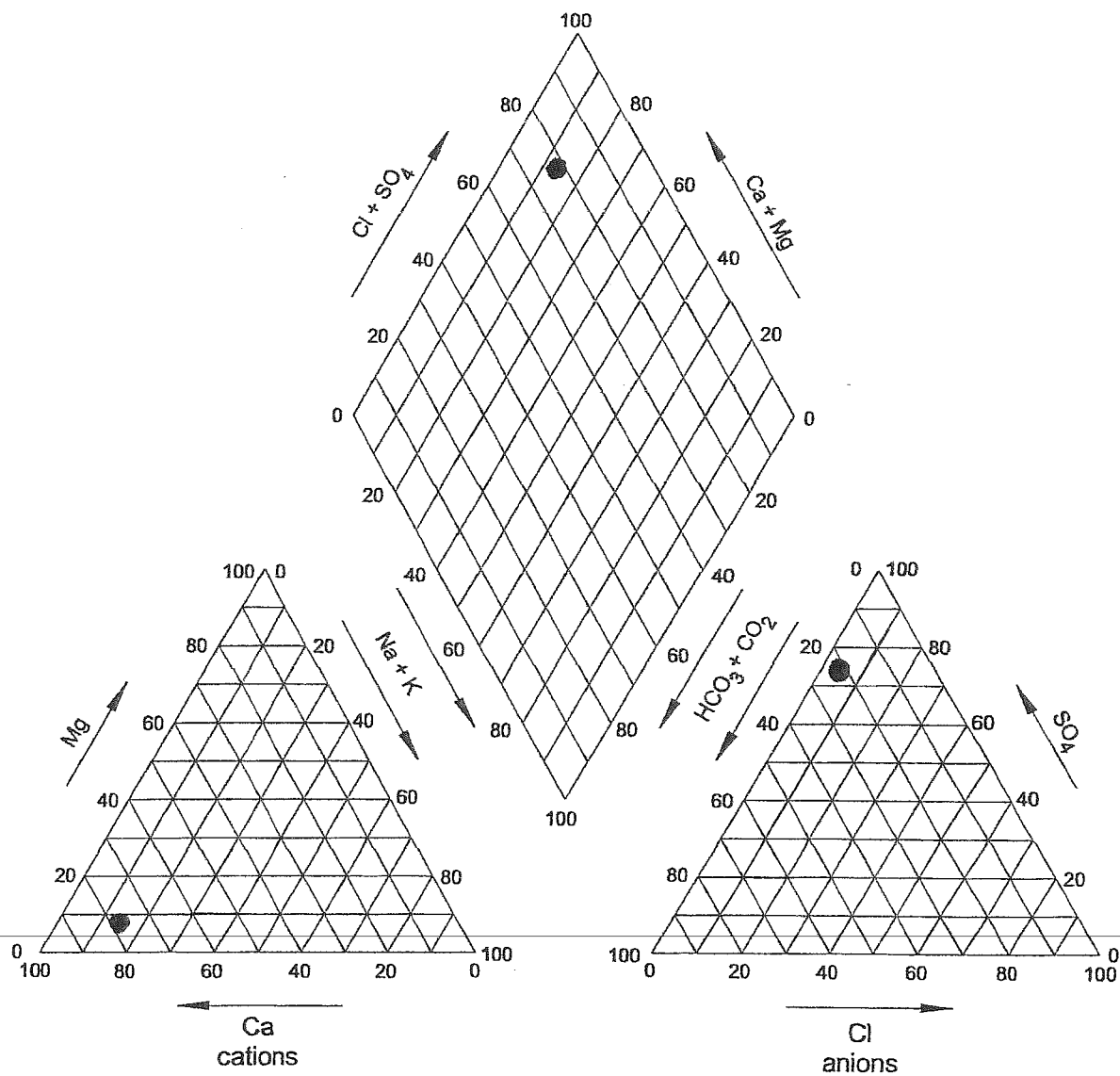
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# Pinon Ridge Subdivision



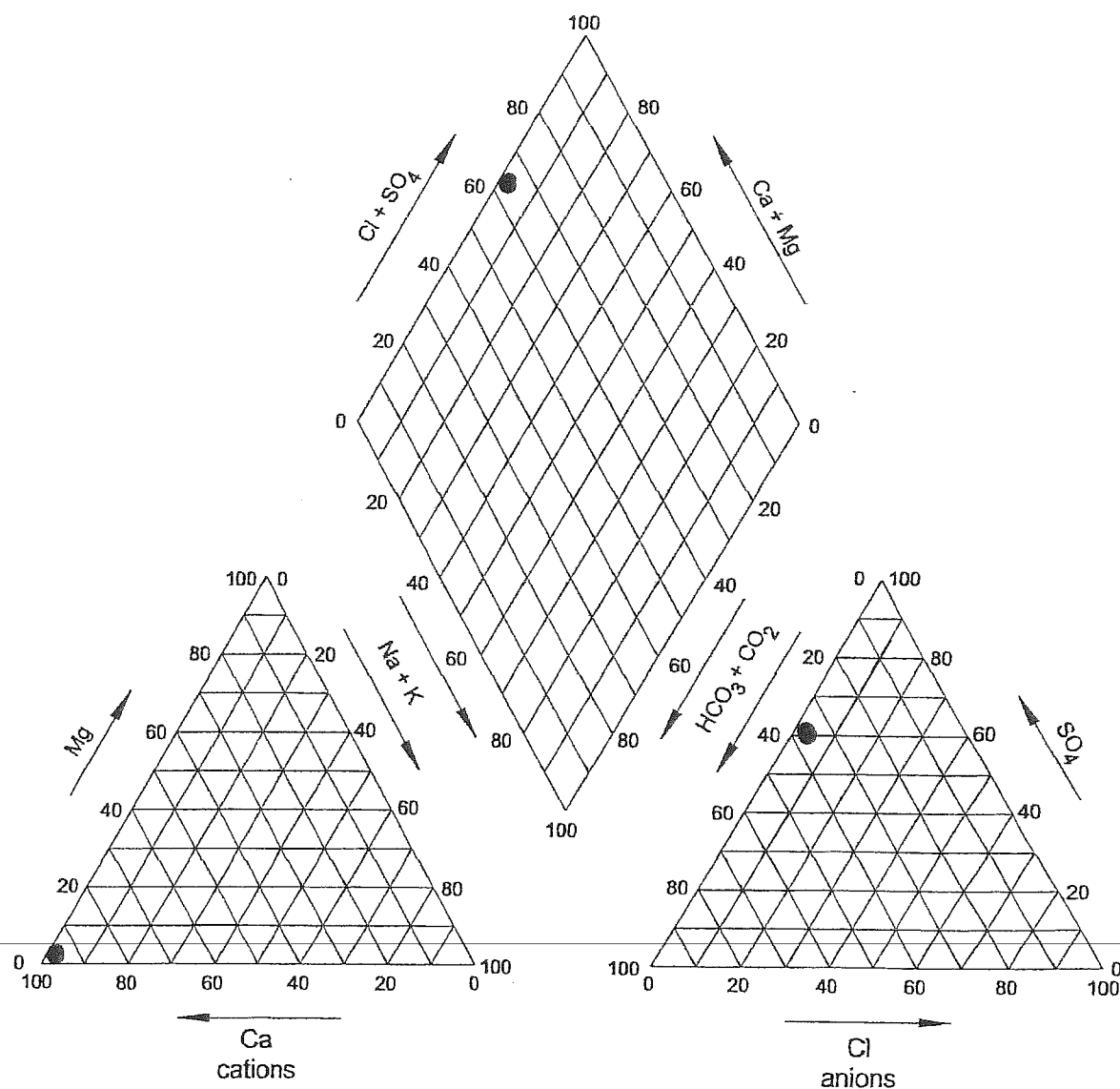
**FIGURE 9**

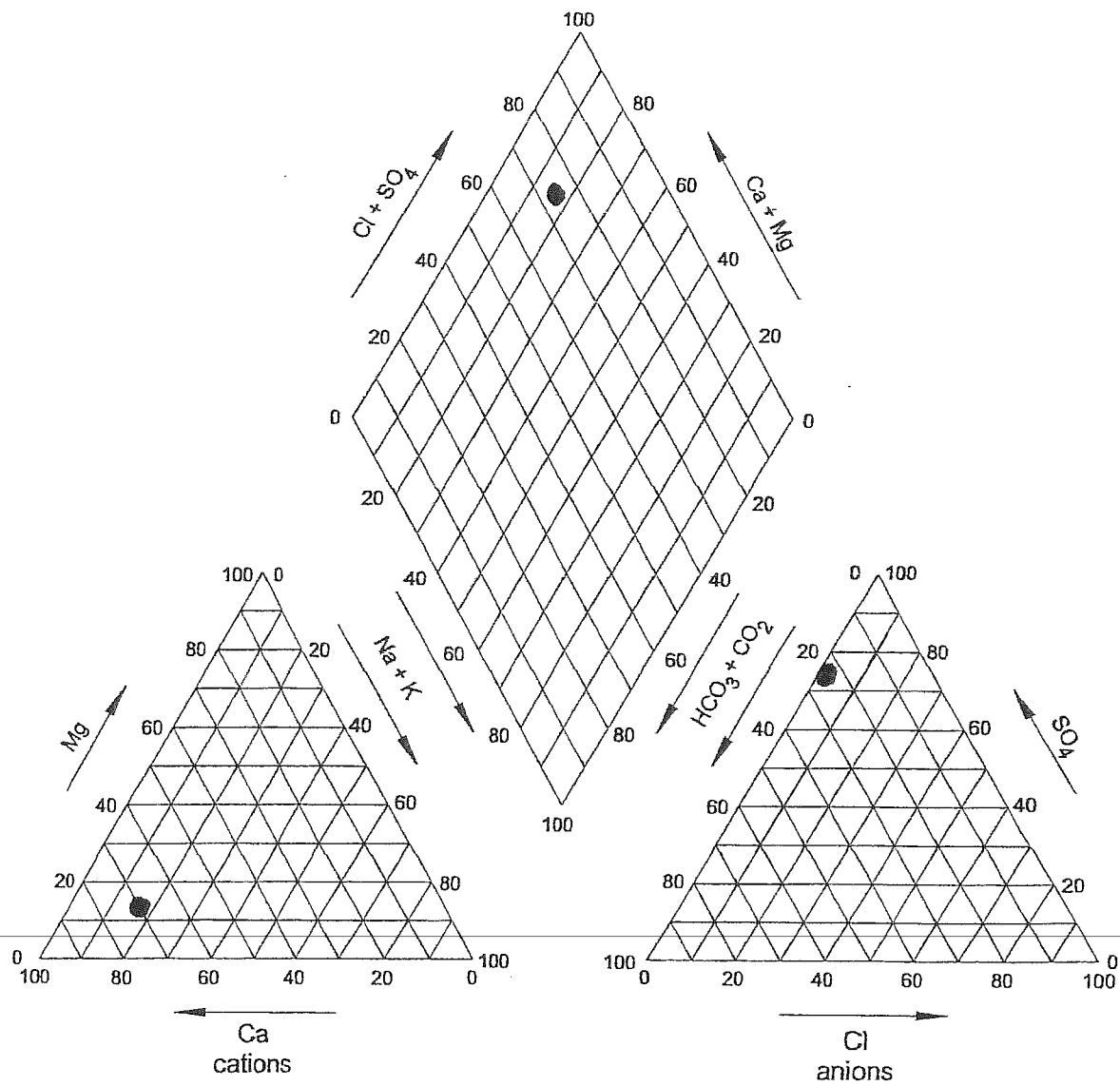
# 6 Oak Pl



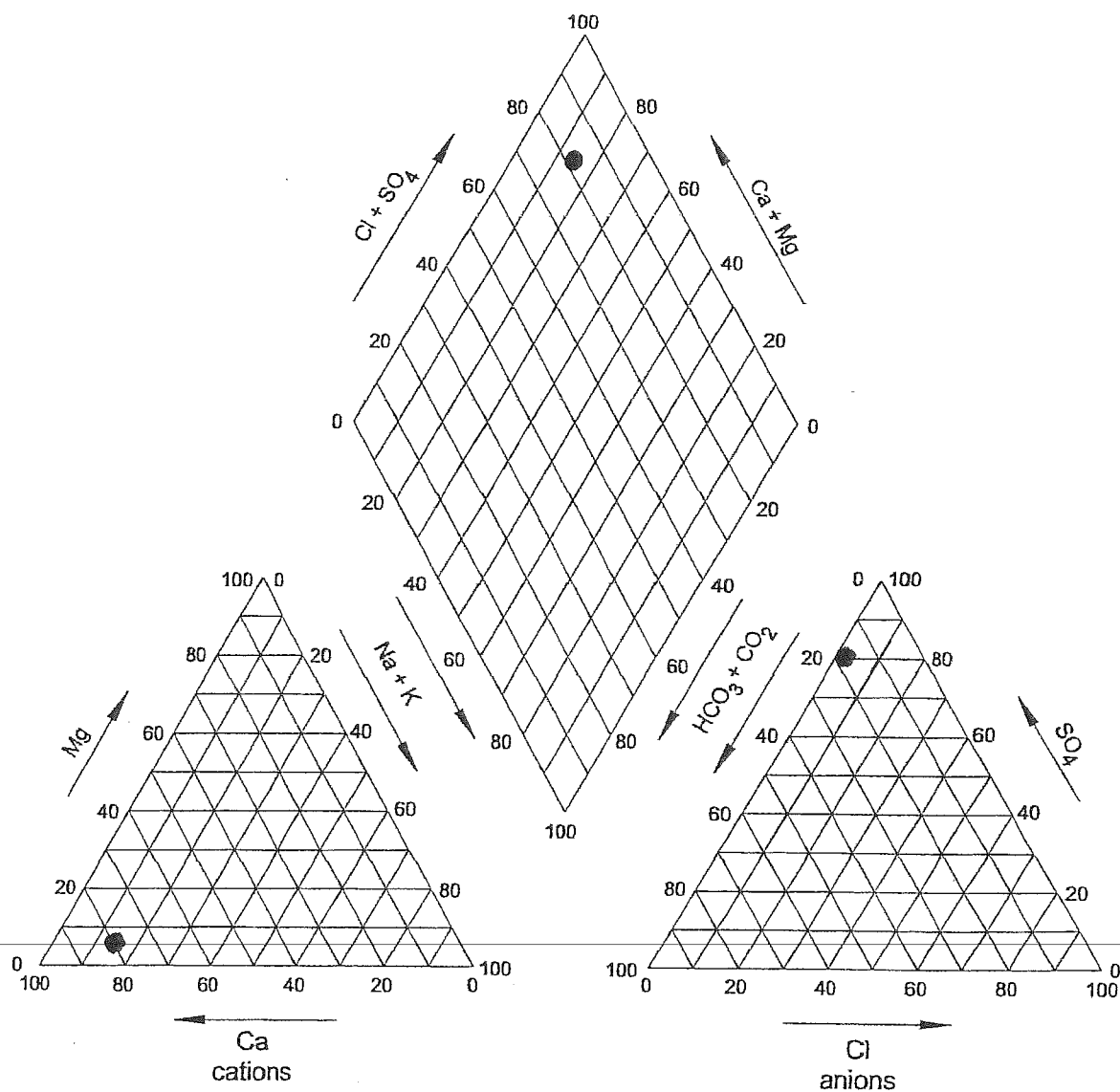


# 19 Juniper Hill Lp

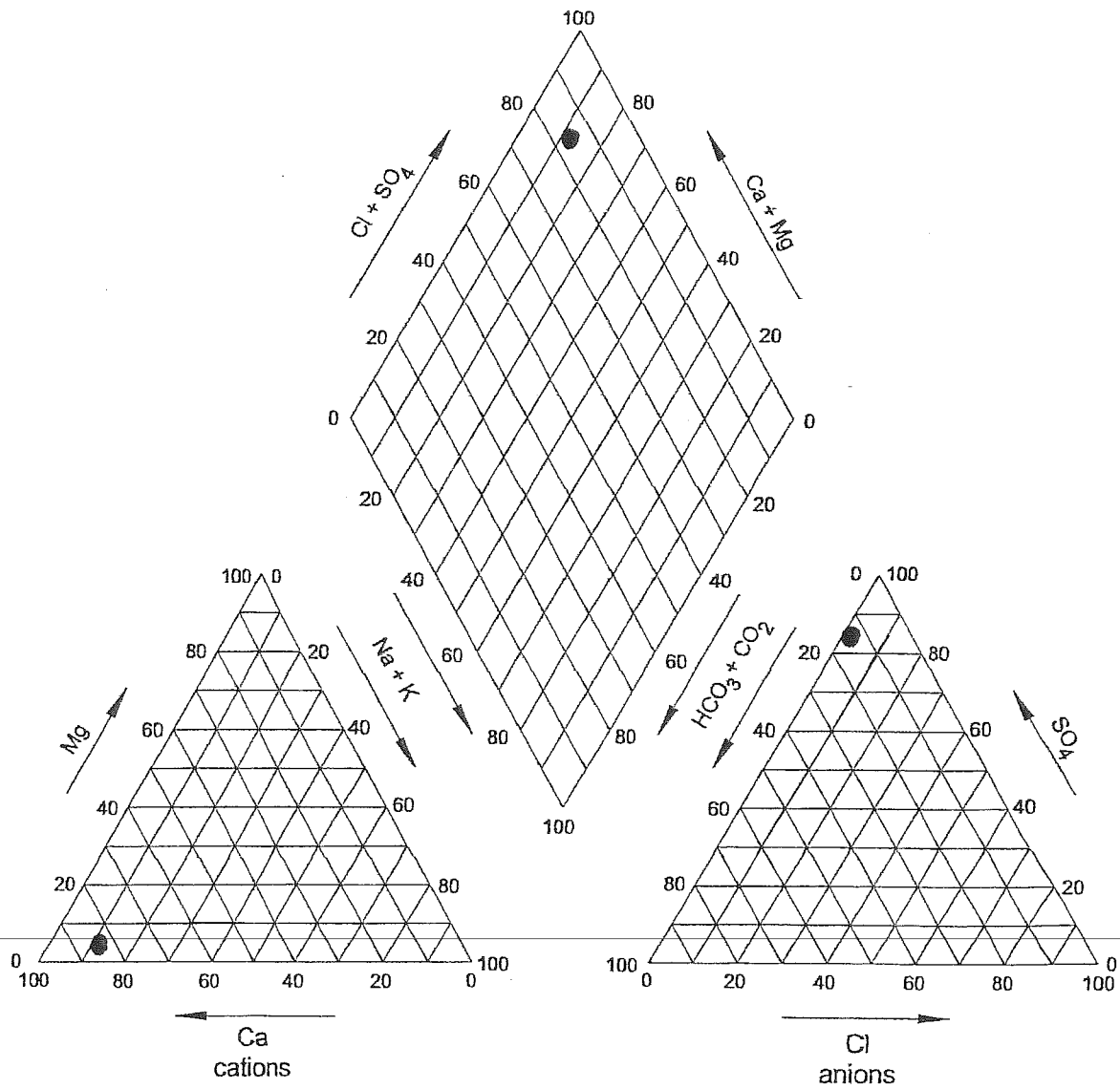




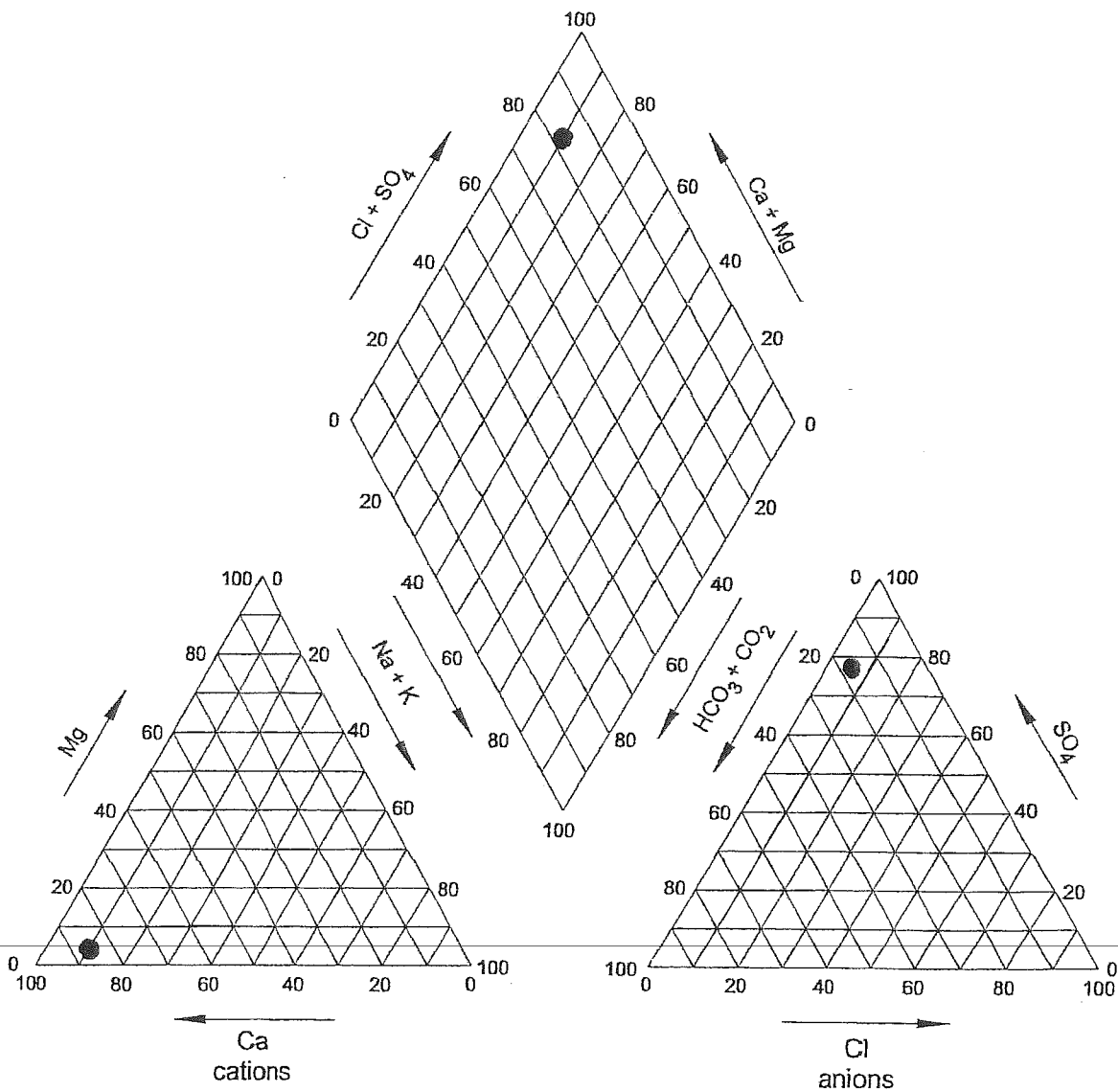
# 58 Juniper Hill Lp



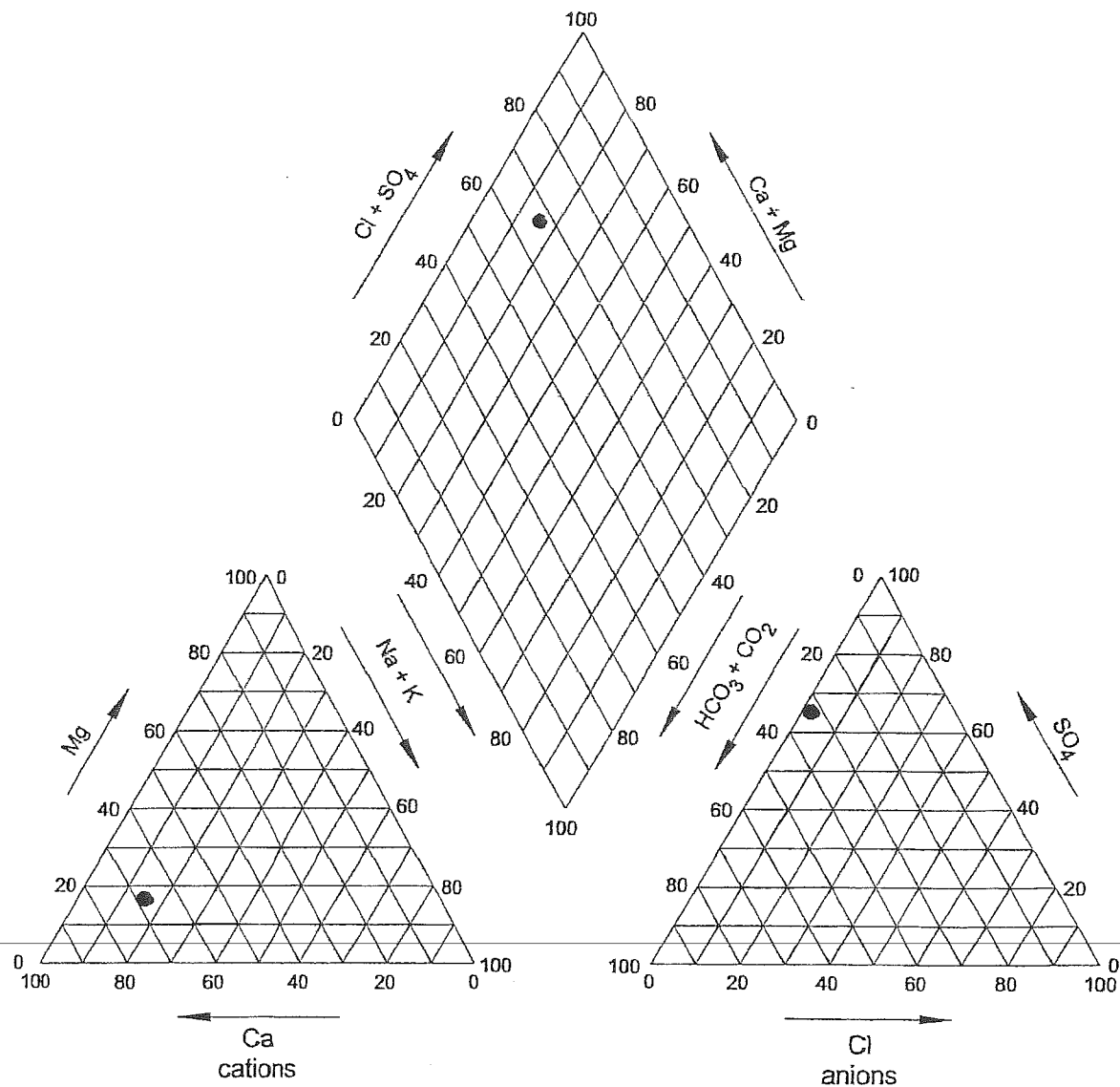
### 3 Fir Lp



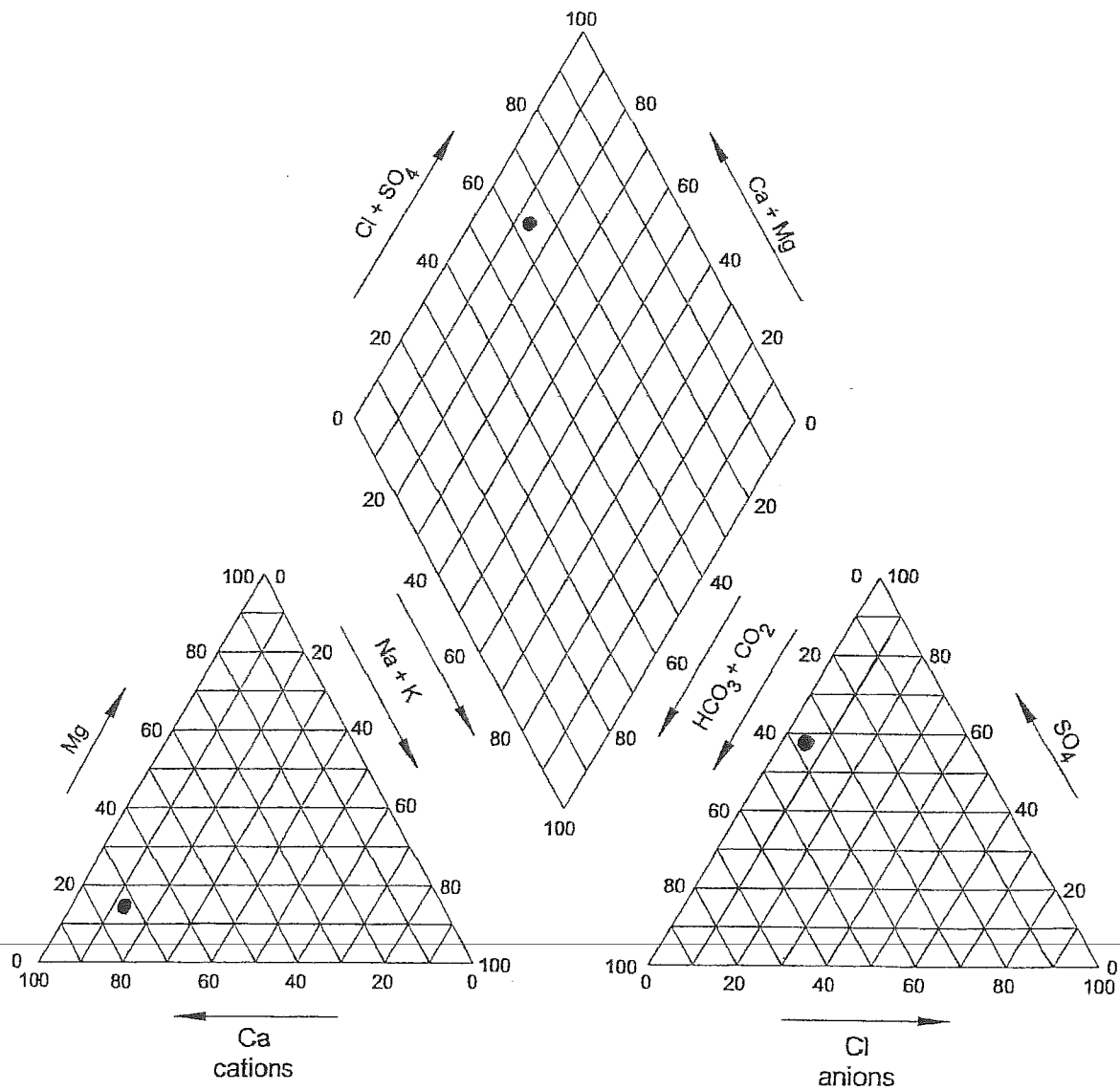
# 28 Ridge Dr



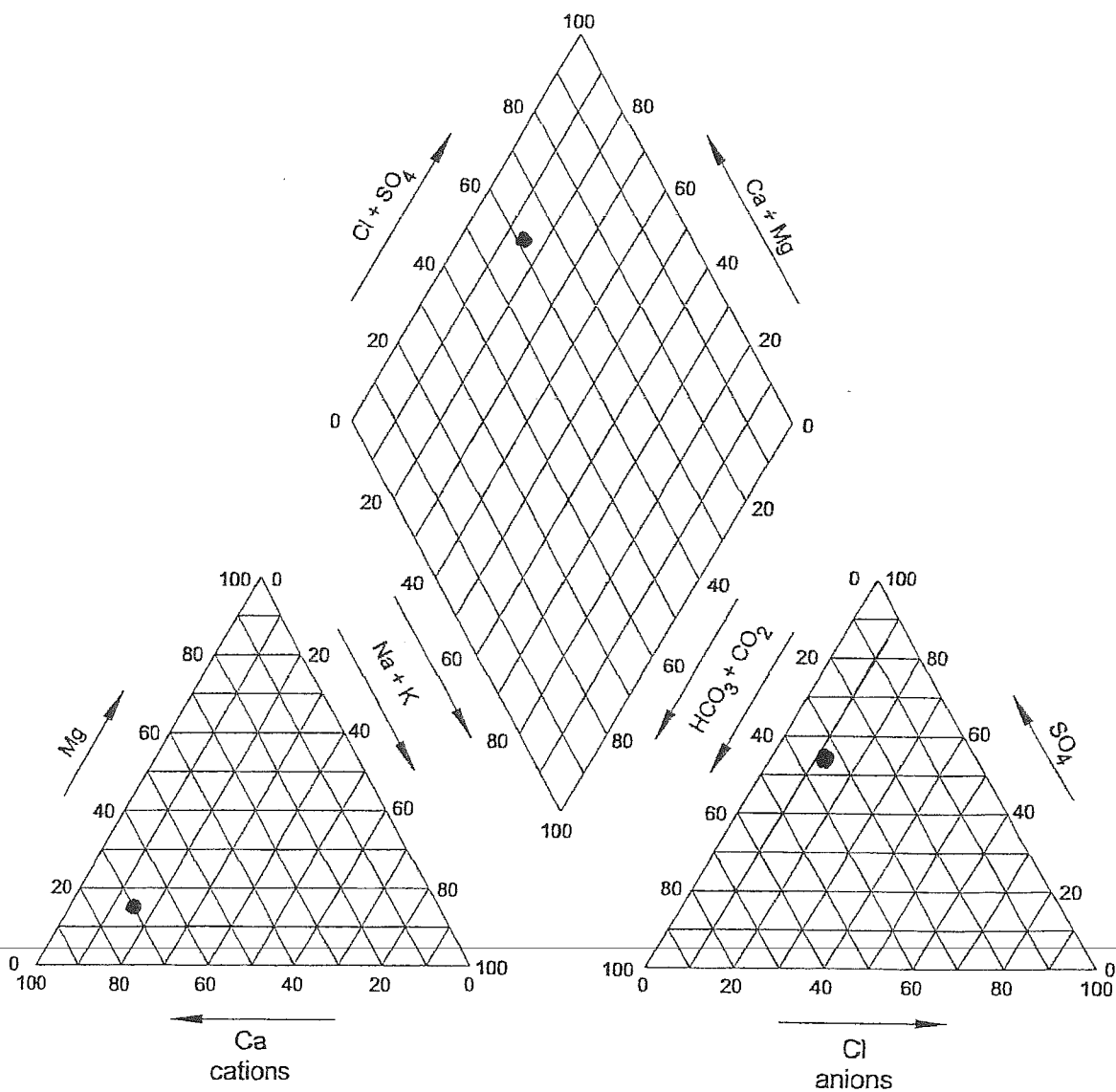
# 9 Juniper Hill Lp



# 17 Juniper Hill Lp

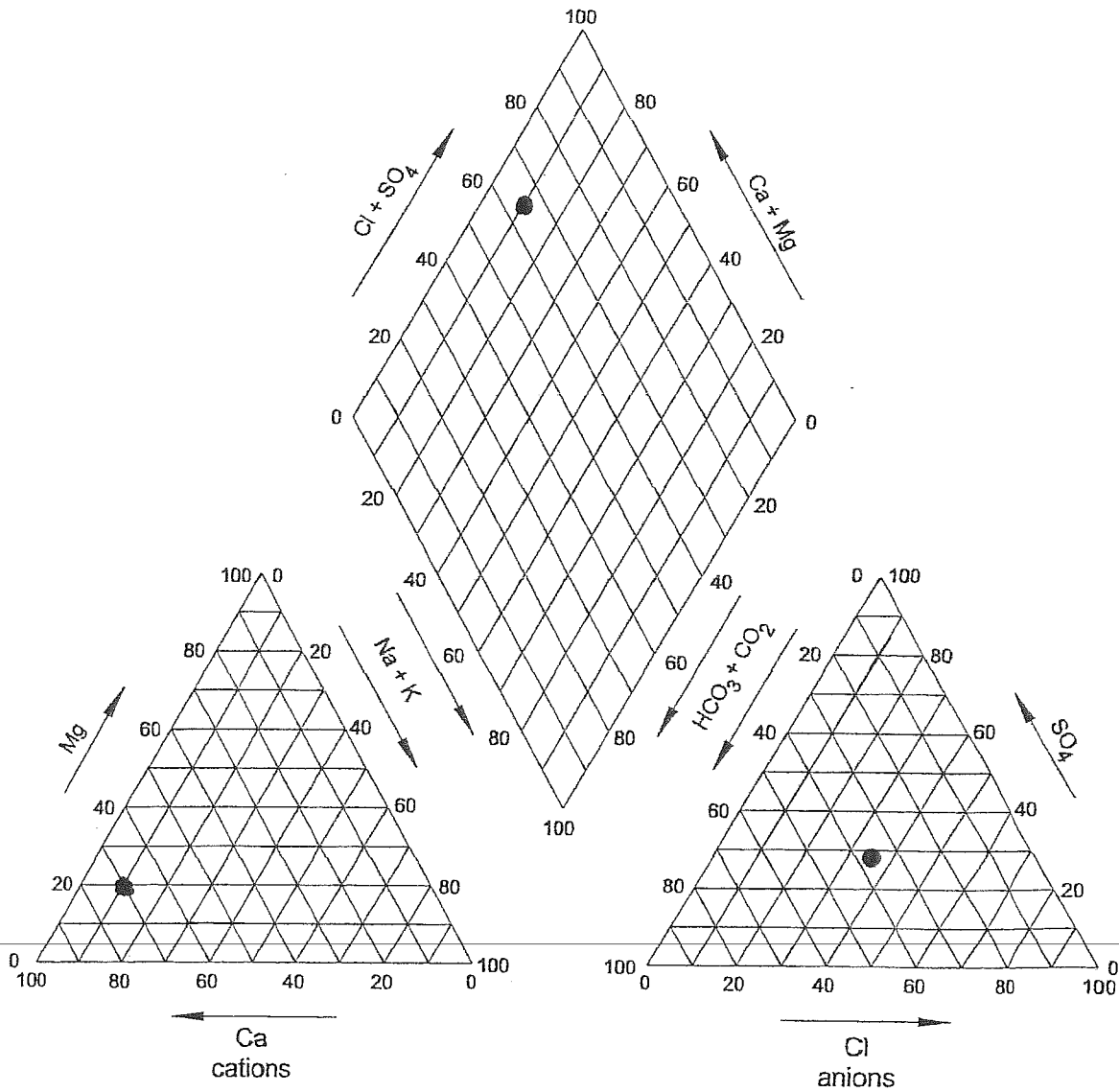


# 15 Juniper Hill Lp





# 8 Juniper Hill Lp



# TABLES

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**TABLE 2**

**WATER TYPE 1**

46 Mulberry Lp  
37 Mulberry Lp  
66 Juniper Hill Lp  
15 Aspen Lp

**WATER TYPE 2**

14 Pine Lp  
37 Juniper Hill Lp  
5 Juniper Hill Pl  
2 Mulberry Ct  
64 Juniper Hill Lp  
35 Fir Lp  
20 Sycamore Dr  
6 Pine Lp  
5 Pine Pl  
4 Juniper Hill Lp

**WATER TYPE 3**

23 Ridge  
41 Mulberry Lp  
12 Cedar Hill Dr  
5 Mulberry Lp  
27 Ridge Dr  
88 Juniper Hill Lp  
97 Juniper Hill Lp  
91 Juniper Hill Lp

**WATER TYPE 4**

3 Mulberry Lp  
8 Cedar Hill Dr  
38 Juniper Hill Lp  
Right of Way

**WATER TYPE 5**

32 Ridge Dr  
7 Cedar Hill Lp  
24 Ridge Dr  
27 Pine Lp  
10 Fir Lp  
5 Sycamore Dr  
22 Juniper Hill Lp  
16 Juniper Hill Lp  
102 Juniper Hill Lp  
32 Juniper Hill Lp

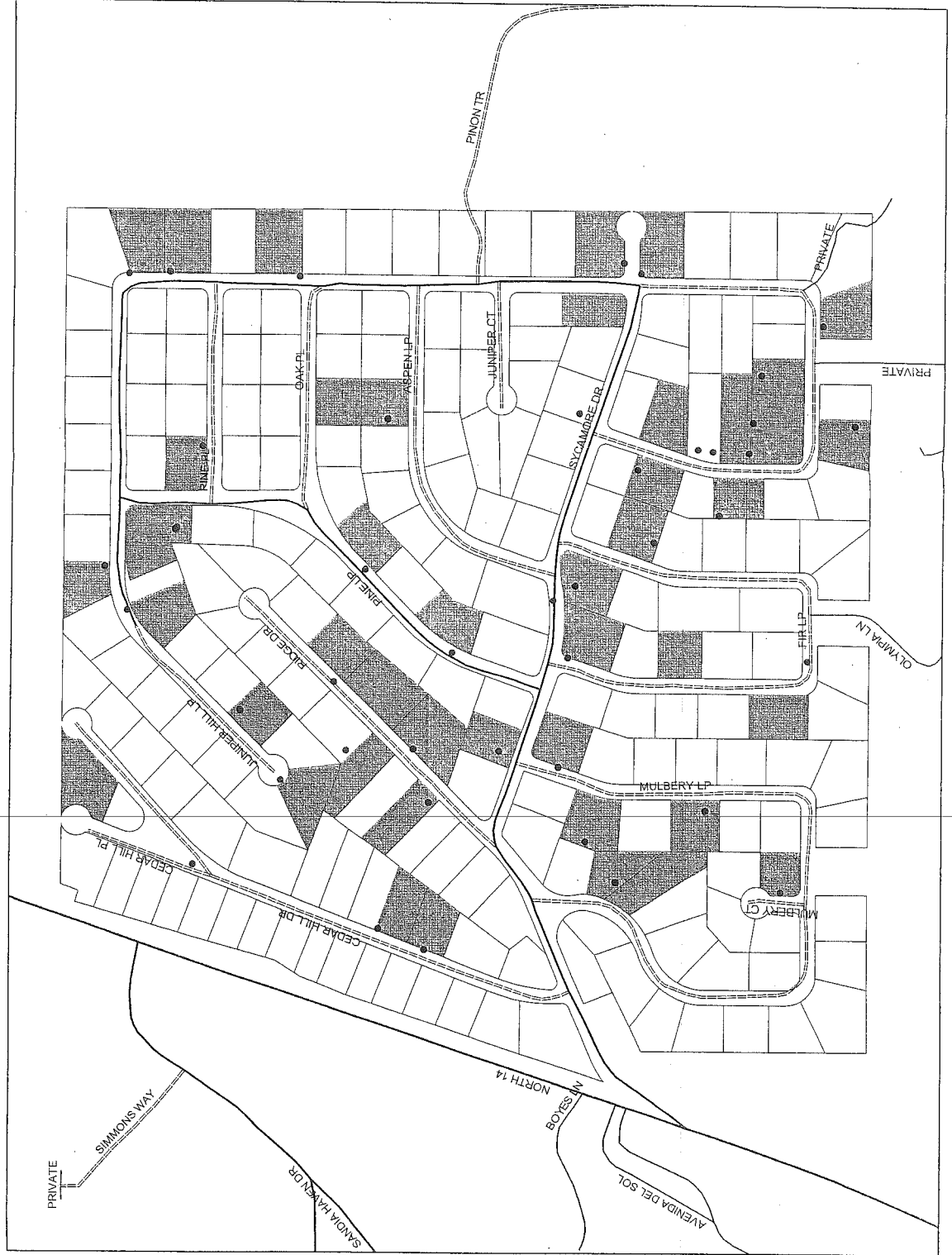
**WATER TYPE 6**

6 Oak Pl  
19 Juniper Hill Lp  
7 Fir Lp  
58 Juniper Hill Lp  
3 Fir Lp  
28 Ridge Dr  
9 Juniper Hill Lp  
17 Juniper Hill Lp  
15 Juniper Hill Lp  
8 Juniper Hill Lp

# FIGURES

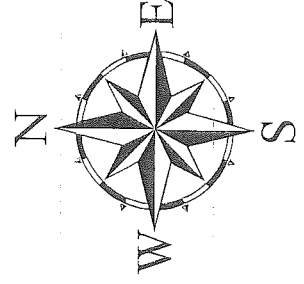
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# Pinon Ridge Subdivision



## Legend

- Located Wells
- Sampled Parcels
- Parcel Boundaries



0 375 750 1,500 2,250 3,000 Feet

# Pinon Ridge Subdivision



FIGURE 2

TABLE 1																								
#	Sites Tested	Physical Address	Softener	Location	Purged	BT-Total	E.Coli	Nitrate	Ammonia	TKN	TOTAL N	Potassium	Sodium	Hardness	Calcium	Magnesium	Alkalinity	Carbonate	Bicarbonate	Chloride	Sulfate	PH	TDS	Ion Balance
1	Right of way	No	No	well	Yes	Absent	Absent	1.1	0.1	0.312	1.412	5.93	30.5	696	179	60.7	397	0	484	142	145	7.5	1030	1.36
2	15 Juniper Hill Lp	No	No	Kitchen sink	Yes	Absent	Absent	0.1	0.2	0.3	0.4	<5	48.1	785	225	49.6	281	0	343	65.2	500	7.47	1180	-1.4
3	17 Juniper Hill Lp	No	No	Kitchen sink	Yes	Absent	Absent	0.1	0.2	0.3	0.4	<5	41.5	765	225	49.6	281	0	343	65.2	500	7.47	1180	-1.4
4	16 Juniper Hill Lp	Yes	Yes	Outside Tap	Yes	Absent	Absent	0.1	0.2	0.3	0.4	<5	61.7	854	191	91.9	386	0	471	202	325	7.33	1340	-1.2
5	4 Juniper Hill Lp	No	No	Kitchen sink	Yes	Present	Absent	0.1	0.2	0.3	0.4	<5	62.1	834	260	44.7	216	0	263	15.5	690	7.45	1250	0.648
6	15 Aspen Lp	Yes	Yes	Outside Tap	Yes	Absent	Absent	0.16	1.16	2.16	2.32	<5	519	17.8	7.13	<1	173	0	211	19.2	950	7.42	1620	-1.8
7	32 Juniper Hill Lp	No	No	Kitchen sink	Yes	Absent	Absent	0.53	1.53	2.53	3.06	<5	65.7	574	149	49.3	285	0	348	186	168	7.65	940	-0.4
8	7 Juniper Hill Lp	Yes	Yes	Outside Tap	Yes	Absent	Absent	1.1	2.1	3.1	4.2	<5	32.9	841	231	64.2	269	0	329	338	251	8	1290	-5
9	81 Juniper Hill Lp	No	No	Kitchen sink	Yes	Absent	Absent	0.1	0.2	0.3	0.4	<5	91.4	100	30.9	5.55	168	0	205	92.8	28.6	7.9	424	-4.7
10	2 Mulberry Ct	Yes	Yes	Outside Tap	Yes	Present	Absent	1.3	2.3	3.3	4.6	<5	44.1	890	302	32.9	170	0	207	<10	759	7.51	1340	1.27
11	5 Pine Pl	No	No	Kitchen sink	Yes	Absent	Absent	0.1	0.1	0.1	0.1	<5	20.9	1530	590	14.8	178	0	217	14	1240	7.31	2000	2.78
12	46 Mulberry Lp	Yes	Yes	Outside Tap	Yes	Absent	Absent	1.9	0.1	0.293	2.193	381	14.4	<6	<1	<1	246	0	300	107	234	7.42	1020	-10
13	5 Juniper Hill Pl	No	No	Kitchen sink	Yes	Present	Absent	0.1	0.1	0.1	0.2	<5	54.5	775	239	43.4	210	0	257	16	643	7.24	1190	-0.57
14	37 Juniper Hill Lp	Yes	Yes	Outside Tap	Yes	Absent	Absent	0.1	0.1	0.1	0.2	<5	88	936	296	48.2	167	0	204	<10	898	7.64	1580	1.1
15	102 Juniper Hill Lp	No	No	Kitchen sink	Yes	Absent	Absent	3.2	0.1	0.391	3.591	<5	109	625	176	44.9	222	0	270	422	30.7	7.44	1460	0.825
16	38 Juniper Hill Lp	No	No	Outside Tap	Yes	Absent	Absent	2.8	0.1	0.194	2.994	<5	51.9	525	137	44.7	295	0	359	106	148	7.59	800	3.24
17	6 Pine Lp	Yes	Yes	Pump house	No	n/a	n/a	0.13	0.1	0.114	0.244	<5	45.9	1280	472	23.5	165	0	202	12.3	1070	7.12	1740	2.72
18	22 Juniper Hill Lp	Yes	Yes	Outside Tap	Yes	n/a	n/a	0.1	0.1	0.1	0.2	<5	41.9	570	161	41.1	268	0	327	28.2	374	7.12	884	-2.7
19	97 Juniper Hill Lp	No	No	Kitchen sink	Yes	n/a	n/a	2.4	0.1	0.209	2.609	<5	125	103	29.7	7.08	191	0	233	108	23.7	7.73	430	1.1
20	Juniper Hill Lp	Yes	Yes	Pump house	Yes	n/a	n/a	0.1	0.1	0.1	0.2	<5	57.3	989	333	38.6	159	0	194	<10	949	7.49	1550	-1.5
21	35 Fir Lp	Yes	Yes	Outside Tap	Yes	Absent	Absent	0.1	0.1	0.1	0.2	<5	71	1660	620	27.9	159	0	194	<10	1480	7.06	2300	3.36
22	64 Juniper Hill Lp	No	No	Kitchen sink	Yes	Absent	Absent	0.13	0.1	0.1	0.23	<5	37.3	1030	365	28.4	174	0	212	10.8	933	7.14	1530	-2.2
23	8 Cedar Hill Dr	Yes	Yes	Garage	No	Present	Absent	4.2	0.1	0.261	4.461	<5	76.4	428	119	31.7	231	0	282	289	16.3	7.3	1010	-4.9
24	88 Juniper Hill Lp	No	No	Kitchen sink	Yes	Absent	Absent	1.3	0.1	0.134	1.434	<5	83	94	29.7	4.81	182	0	222	59.8	29.5	8.05	384	-4
25	14 Pine Lp	Yes	Yes	Outside Tap	Yes	Absent	Absent	0.21	0.1	0.1	0.31	1110	8.69	38	15.2	<1	176	0	214	15.9	1170	7.67	2250	2.12
26	66 Juniper Hill Lp	Yes	Yes	Outside Tap	Yes	Present	Absent	0.15	0.1	0.1	0.25	915	20.6	7.87	3.15	<1	193	0	235	<10	860	7.61	1720	5.83
27	27 Ridge Dr	No	No	Kitchen sink	Yes	Present	Absent	3.4	0.1	0.22	3.62	<5	144	221	71.2	10.5	213	0	280	150	29.3	7.88	532	7.8
28	37 Mulberry Lp	Yes	Yes	Kitchen sink	No	Present	Absent	0.26	0.1	0.227	0.487	670	74	<5.6	1.25	<1	158	0	193	112	613	7.85	1500	3.36
29	9 Juniper Hill Lp	Yes	Yes	Kitchen sink	Yes	Absent	Absent	0.1	0.1	0.1	0.2	8.98	55.7	754	225	46.7	236	0	288	14.2	592	7.42	1230	0.734
30	5 Sycamore Dr	No	No	Kitchen sink	Yes	Absent	Absent	1.5	0.1	0.177	1.677	<5	77.3	404	134	16.6	232	0	283	74.5	198	7.4	712	2.51
31	10 Fir Lp	No	No	Kitchen sink	Yes	Absent	Absent	0.1	0.1	0.1	0.2	5.59	58.1	481	110	44.9	219	0	267	21.3	298	7.68	800	3.02
32	27 Pine Lp	Yes	Yes	Outside Tap	Yes	Absent	Absent	3.5	0.1	0.281	3.781	<5	38.8	486	164	18.7	211	0	257	141	64.9	7.63	780	9.01
33	28 Ridge Dr	Yes	Yes	Utility room	Yes	Present	Absent	0.43	0.1	0.1	0.53	<5	57.7	1320	498	19.5	209	0	255	32.7	1040	7.6	1740	4.15
34	3 Fir Lp	No	No	Kitchen sink	Yes	Present	Absent	0.14	0.1	0.122	0.262	<5	59.5	1220	434	34.4	168	0	204	11.8	996	7.49	1670	5.09
35	5 Mulberry Lp	No	No	Kitchen sink	Yes	Absent	Absent	1.8	0.1	0.513	2.313	<5	146	103	34.4	4.16	99.2	0	121	160	28.5	7.92	500	8.62
36	12 Cedar Hill Dr	Yes	Yes	Outside Tap	No	Absent	Absent	3.6	0.1	0.525	4.125	388	76.7	<6.6	<1	<1	234	0	286	338	20.9	7.84	1110	<5
37	41 Mulberry Lp	No	No	Kitchen sink	Yes	Absent	Absent	2.5	0.1	0.472	2.972	<5	104	157	52.6	6.13	180	0	219	108	39.7	7.84	482	1.22
38	24 Ridge Dr	No	No	Outside Tap	No	Present	Absent	3.2	0.1	0.533	3.833	<5	37	423	137	19.9	251	0	306	146	64.4	7.45	744	-1.9
39	7 Cedar Hill Lp	Yes (No)	Yes (No)	Outside hose	No	Absent(Present)	Absent(Absent)	4.08(4)	0.1(0.1)	4.34(4.22)	4.514(4.422)	<5(<5)	39.8(90.3)	555(739)	197(184)	15.3(66.1)	258(297)	0	315(362)	116(450)	247(52.1)	7.38(7.63)	854(1460)	2.7 (-2.8)
40	32 Ridge Dr	No	No	Kitchen sink	Yes	Absent	Absent	2.2	0.1	0.231	2.431	<5	38.9	555	197	15.3	258	0	315	116	247	7.37	854	-2.8
41	3 Mulberry Lp	No	No	Kitchen sink	Yes	n/a	n/a	2.89	0.1	0.308	3.198	<5	115	481	143	30.4	221	0	270	347	23.6	7.45	1100	-0.39
42	58 Juniper Hill Lp	Yes	Yes	Kitchen sink	Yes	n/a	n/a	0.146	0.1	0.1	0.246	6.27	57.1	979	346	28	171	0	208	20.4	892	7.27	1480	-0.71
43	23 Ridge Dr	No	No	Kitchen sink	Yes	n/a	n/a	1.4	0.1	0.168	1.568	<5	118	87.3	28.6	3.87	164	0	200	73	34.4	7.26	394	6.37
44	7 Fir Lp	No	No	Outside tap	Yes	Absent	Absent	0.1	0.1	0.1	0.3	<5	55.6	710	222	37.7	169	0	206	<10	639	7.58	1110	-0.26
45	19 Juniper Hill Lp	Yes	Yes	Outside tap	Yes	Absent	Absent	0.1	0.1	0.1	0.1	280	50.2	341	98.4	23.1	230	0	281	23.3	451	7.29	1010	4.79
46	5 Oak Pl	No	No	Outside tap	No	Absent	Absent	0.34	0.1	0.102	0.442	<5	51.8	980	326	35.1	190	0	232	36.1	824	7.41	1420	-1.2